

ental quest

April 1951

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About Our CONTRIBUTORS

ROBERT B. SLOANE, D.D.S. (New York University, College of Dentistry, 1941) is a general practitioner whose particular interest is reconstruction dentistry. Publishing in DENTAL DIGEST for the first time in the current issue, Doctor Sloane presents ONE COMPONENT OF MANDIBULAR FUNCTION.

PAUL J. BOYENS, D.D.S. (College of Physicians and Surgeons, School of Dentistry, 1902) is widely represented in dental literature by his articles on periodontia and dental medicine in which he specializes. The material in Doctor Boyens' article in the current issue of DIGEST, PATHOLOGIC DRIFTING: TREATMENTS FOR SPONTANEOUS REGULATION, was presented before the Pacific Coast Dental Conference in Salt Lake City as well as before several associations in San Francisco.

In this issue Doctor THOMAS H. FORDE of Washington, D.C. who is a specialist in oral dynamics presents the fourth and final installment of his article, ORAL DYNAMICS, which is illustrated by Doctor Edward Koltisko, also a practitioner in Washington.

EDWARD J. RYAN, B.S., D.D.S., Editor

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One Component

of MANDIBULAR FUNCTION*

ROBERT B. SLOANE, D.D.S., New York

DIGEST

Recognition of the importance of the opening and closing axis of the mandible makes it possible to avoid many difficulties. The condyle, as any other joint, functions within the physical limits of the configuration of its component parts.

This paper describes one component of mandibular function and illustrates how it may be used.

Technique

In order for the mandible to perform as a lever capable of exerting a functional force, it must have a fulcrum. The head of the condyle is cradled

in the glenoid fossa by the musculature of the mandible which elevates it and retrudes it so that a maximum functional force may be exerted. The jaw may be opened and closed with the mandible in a retruded position; when it does, the component parts of the condylar joint glide one upon the other. There must be a point of rotation within either condyle as the mandible opens and closes in a hinge-like fashion.

An imaginary line joining those two points of rotation is known as the hinge axis. This concept is not new. Face-bows designed to relate the teeth to the axis upon which they function have been in use some time. However, in dealing with fine occlusal contacts, before using an axis which can markedly affect the occlusal relationship, it must be determined with great accuracy.

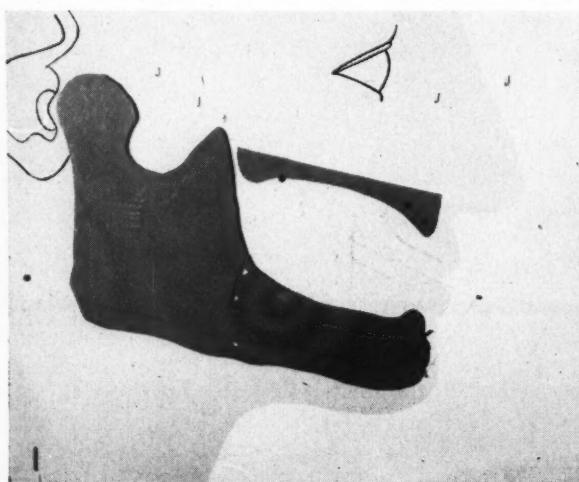
The technique presented is illustrated with an edentulous case (Fig. 1).

Step One—The patient is first rehearsed in a simple opening and closing function. He is asked to protrude the mandible as far as possible, retrace it, and holding it retruded, open and close. That motion is repeated until it becomes a familiar one, easily accomplished, with no force from the operator (Fig. 2).

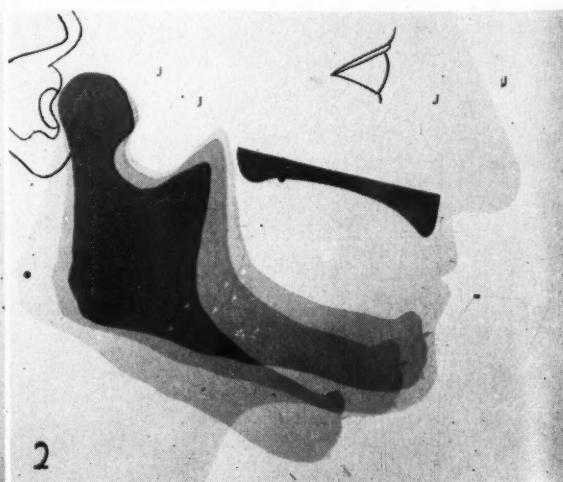
Step Two—Attach a clutch to the mandible from which a stud protrudes beyond the border of the lips (Fig. 3). The purpose of the clutch and stud is to provide a mechanical extension of the mandible to which a face-bow may be easily attached. The face-bow is then fixed to the stud and the patient is asked to open and close (Fig. 4).

As the patient opens and closes the pointer of the face-bow will arc. The arc traced by the pointer is a segment of a circle, the center of rotation is the axis (Figs. 5 and 6).

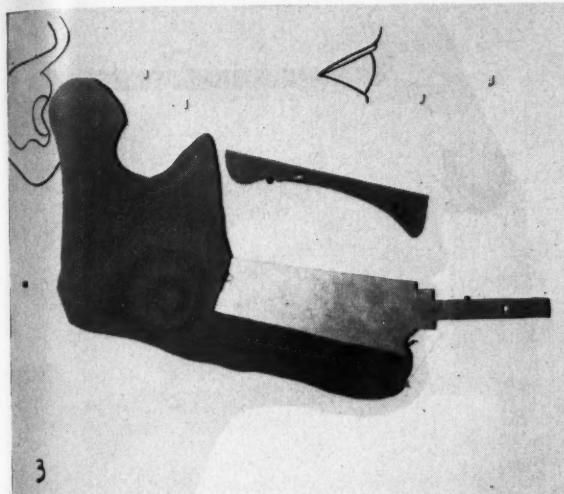
*The material in this article was first presented before the Greater New York Dental Meeting, December 1949, under the title, LOCATING THE HINGE AXIS, ITS VALUE IN DENTAL RESTORATIONS.



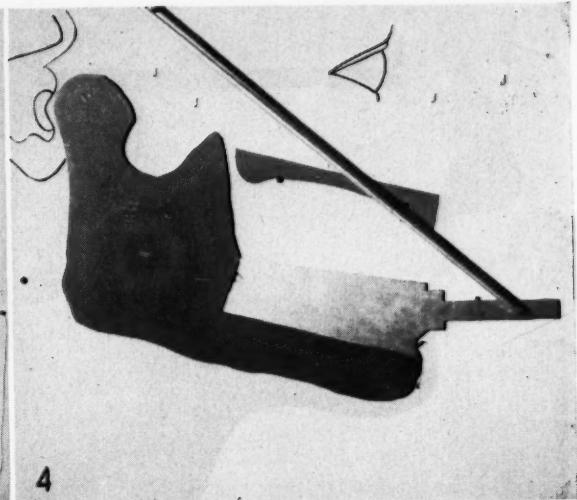
1. The edentulous case.



2. Simple opening and closing function.



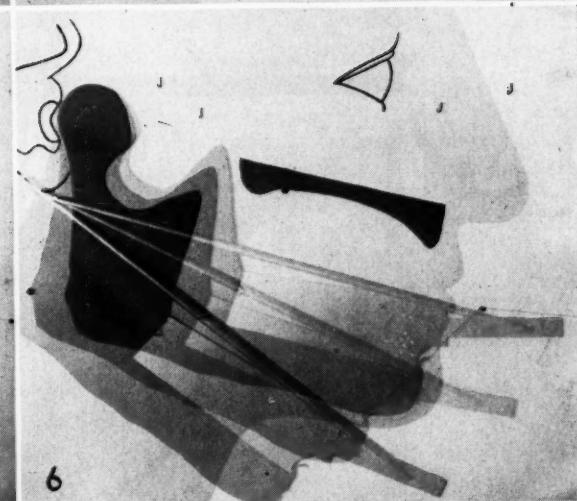
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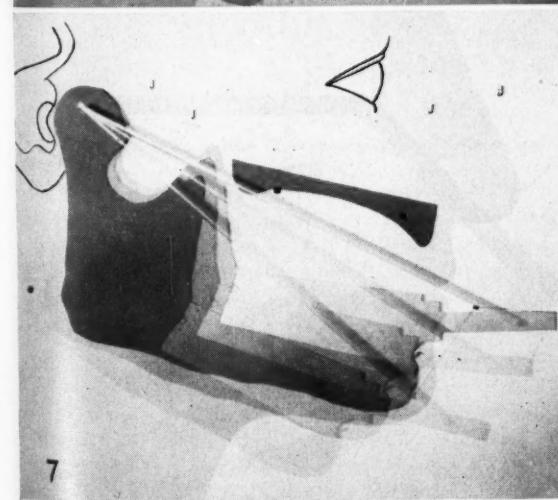
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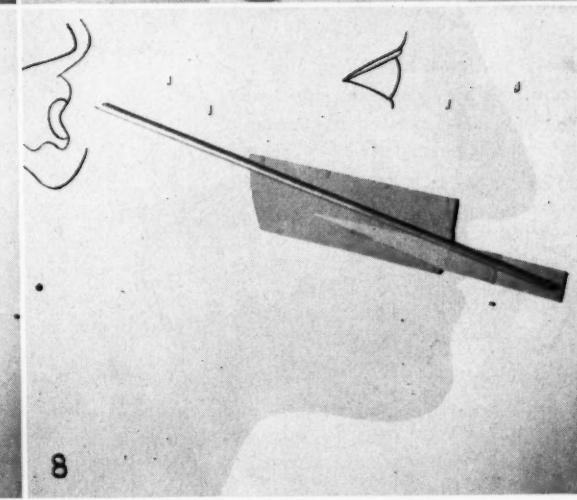
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6



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8

3. Clutch and stud attached to mandible.

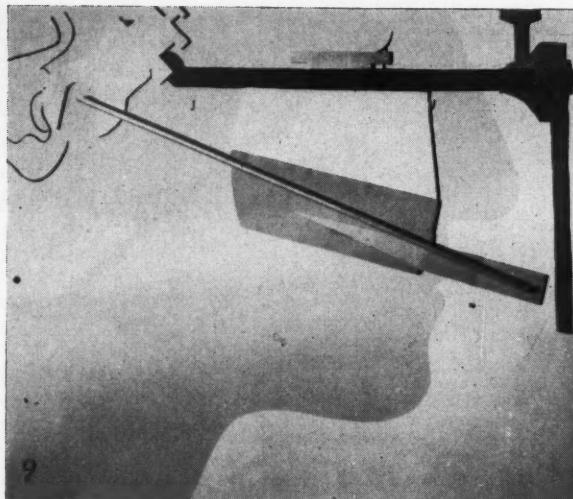
4. Face-bow attached to stud.

5. Pointer arcing above and in front of the axis.

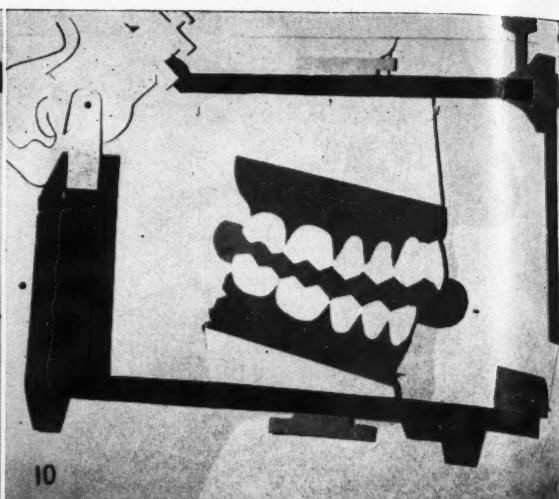
6. Pointer arcing below and behind the axis.

7. Pointer rotating over the axis.

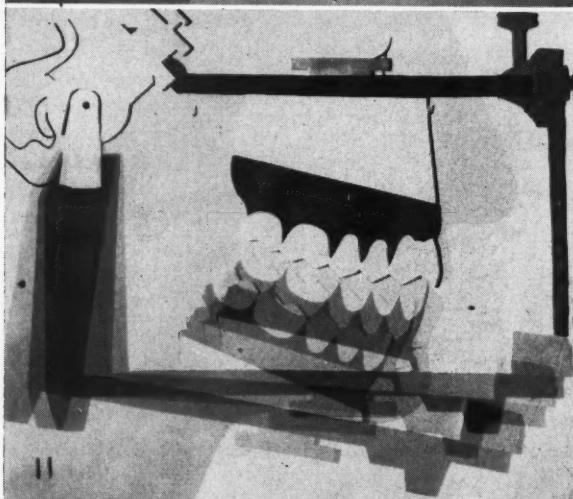
8. Upper base in place with face-bow adjusted to axis.



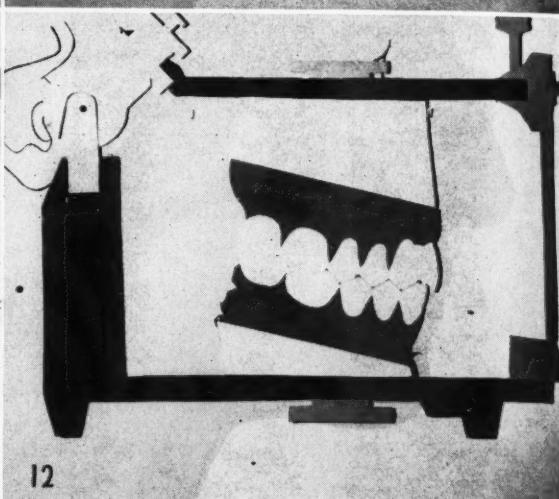
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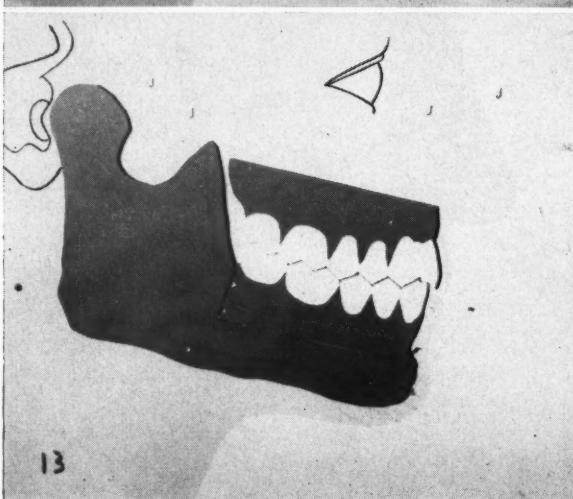
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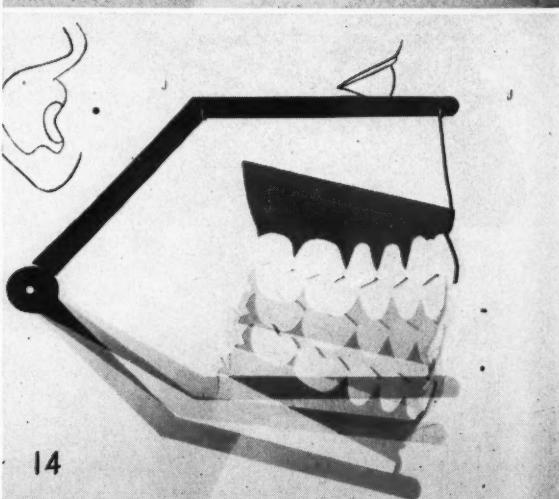
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12



13



14

9. Transferring the upper model to the upper bow of the articulator.

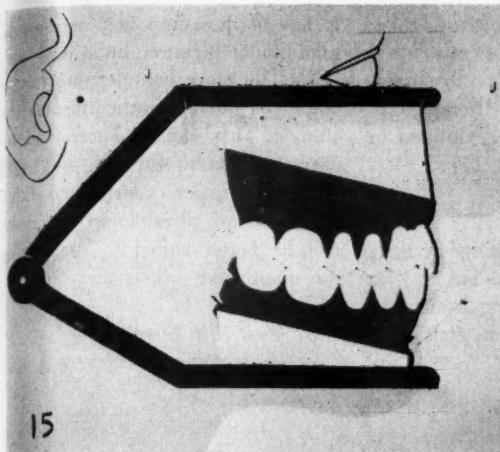
10. Relating the lower model to the upper by means of a centric bite.

11. Opening and closing of dentures on articulator.

12. Dentures on articulator.

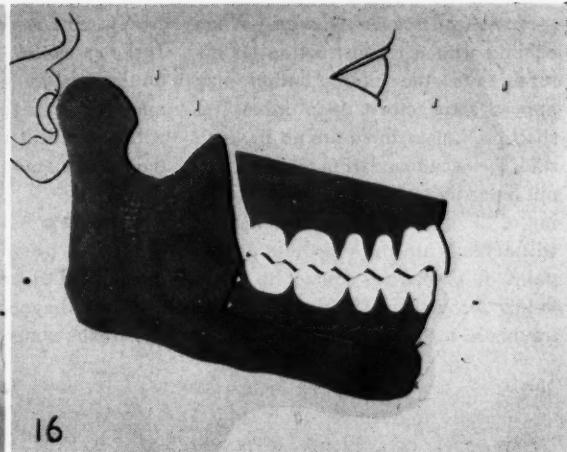
13. Dentures in the mouth.

14. Opening and closing of dentures on articulation.



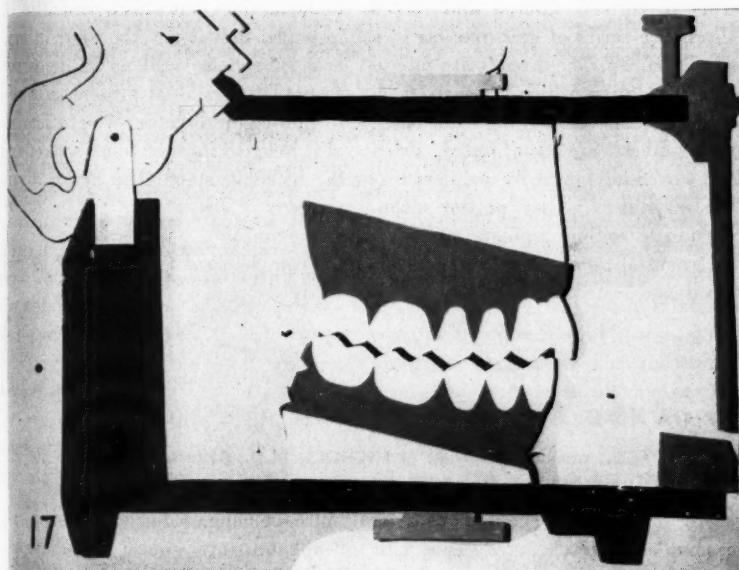
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15. Dentures in centric on articulator.



16

16. Dentures before skidding into interdigitation.



17

17. Same discrepancies as exhibited in mouth.

Step Three—1. The face-bow is adjusted to find the center of the circle. The arc becomes smaller as the axis is approached. When the point finally rests over the axis, the pointer will not arc but rotate (Fig. 7). The axis is determined individually on both sides as there is a surprising lack of physiognomic symmetry.

2. The points are then marked upon the skin and the face-bow removed. The hinge axis is not a variable position, it may be determined repeatedly. After it is once found it may be redetermined. After a few tries it can be seen how exact a position it is.

Step Four—1. The face-bow is at-

tached to a bite fork which has been rigidly fitted into an accurately fitting maxillary base. The upper base is inserted and held in place by the lower base. The face-bow pointers are adjusted until they are directly over the determined axis on either side (Fig. 8).

2. The upper base, with fork and face-bow, are removed and a model of the upper is seated in the base. The face-bow is adjusted to the articulator so that the pointers are directly over the axis of the instrument. The model is attached to the upper member of the articulator (Fig. 9).

Step Five—1. The lower base and model are related to the upper by

means of a centric bite (Fig. 10). The models are now oriented to the axis of the instrument in the same fashion as the jaws are related to the axis of the patient. The dentures are constructed to provide the required interdigitation (Fig. 11).

2. The dentures when inserted will open and close in the patient's mouth as they did upon the articulator because they were constructed on the axis upon which the mandible functions (Figs. 12 and 13).

Comparison of Techniques

Cases not constructed on the hinge axis may be considered for comparison:

1. The models are centered on the articulator and related to each other by means of a centric bite.

2. The interdigitation on the articulator will be good but will not be the same when the cases are inserted because the models were constructed to function on the axis of the instrument and not upon the patient's axis (Figs. 14 and 15).

3. The patient may be able to skid the bases so that the teeth interdigitate but the consequences of that discrepancy are well known (Fig. 16).

Exertion of Mandibular Force—In chewing function the mandible operates by a system of unconscious control within the limits dictated by the physiologic pattern of its condylar joints. To exert its maximum force it is retruded as it goes through its envelope of motion.

Method of Accommodation—When dealing with a reconstruction on natural teeth, the interdigititation may appear satisfactory upon initial inspection, but as there are no bases to skid, the accommodation made to permit interdigititation is a bodily shifting of the mandible. The musculature will actually tip the mandible on the point of premature contact to force the teeth together. The results of that traumatic force will soon be noticed.

Reverse Discrepancies Exhibited—If the cases that were not constructed on the axis are mounted on the anatomic articulator the same discrepancies will be evident as those exhibited in the patient's mouth (Fig. 17).

Summary

1) The use of the hinge axis is not limited to prosthetics but may be used for diagnosis and treatment in any of the many dental specialties. It

is one of the component motions of mandibular function, but a basic one.

2) The more complex movements employed during mastication may be studied. They can be determined, recorded, and reproduced.

3) Restorations constructed within the limits of physiologic movement will be better suited to function in the mouth for which they are constructed.

57 West 57th Street.

Dental Aid

PRACTICAL trials by British dentists have shown that thistledown seaweed is effective in stopping gum bleeding after tooth extractions. One application is all that is necessary in most cases and the substance disappears without any trace in about an hour after application. This seaweed, found on the North Scottish coast, consists chiefly of sodium alginate. One of the British textile firms processes it into powder form and then dissolves

it in water to form a thick solution. This in turn is filtered and forced through a series of hair-fine jets in a platinum cap. The threads are passed into a solution which converts them into insoluble calcium alginate. These crude fibers are then tested, dried and woven into gauze by ordinary textile machinery. After partial reconversion to sodium alginate and careful neutralization the material is dried and tested. Unlike some prod-

ucts used for stopping bleeding this material does not affect penicillin. It is hoped that it may be used in general surgery as well as in dentistry. In the latter field, at present, a crown of buff-colored feather-weight material is inserted into the tooth socket and the bleeding stops. The gauze disappears.

From *Medical Times* 79:72 (Feb.) 1951.

Complicated Fractures of the Maxilla

DAVID L. MURPHY, M.D., EDWARD S. MURPHY, M.D., and WILLIAM A. McNICHOLS, M.D., Dixon, Illinois

BADLY SPLINTERED hard palates and alveolar processes will heal if only brought into alignment and immobilized. With the use of the Straith mouthpiece and some dental compound it is astounding how an oral surgeon can mold lacerated hard palates and alveolar processes into perfect functioning maxillas, from both an esthetic and a functional standpoint. These patients require the daily attention of the oral surgeon, not only to maintain cleanliness but also to adjust any errors in initial

correction. These changes can be accomplished much more easily with dental compound than with dental wiring. Some of the loose fragments are sewed together with cotton threads. These maxillary splints are supported by elastic bands, which do not need to be strong or very tight. It is very easy to bring the palate up too high; hence the need for daily removal of the mouthpiece for cleaning and inspection. These elastic bands are attached to a headband because they are easier for us to apply,

but coat hangers buried in a plaster headband are quite satisfactory. There are many other splints available that are highly satisfactory. We feel that it is easier to use prepared splints and headbands, as they are time savers. It is important that they be applied properly; otherwise, they are uncomfortable and will tilt.

From *Journal of the American Medical Association* 145:615 (March 3) 1951.

Pathologic Drifting:

Treatments for SPONTANEOUS REGULATION

PAUL J. BOYENS, D.D.S., San Francisco

DIGEST

Periodontists have observed that after successful periodontal treatment many migrated teeth return spontaneously to their original positions in the dental arch.

This article describes a successful operative procedure for reversing the process of pathologic drifting. Migrating teeth are returned to their normal locations by surgical technique. Five case histories demonstrating the successful results of the procedure are illustrated.

Case Histories

Case One—A patient in her early thirties requested treatment to correct the separation of her centrals.

The separation of the centrals re-

vealed periodontal lesions although the superficial tissue did not indicate the presence of disease. The diagnosis was confirmed by radiographic study. Bone changes precede migration. The results of special treatment in this case is shown in Figures 1A and 1B.

Case Two—The lower incisors were included in this case. The teeth involved were definitely progressing to pathologic exfoliation. The results of periodontal treatment are shown in Figures 2A, 2B, and 2C.

Case Three—Treatment in this case was not begun with optimism and no promises were made for successful results. In contrast to other cases, in this instance the frenum was involved and the lower incisors occluded with the uppers at a right angle. Marked improvement following treatment is

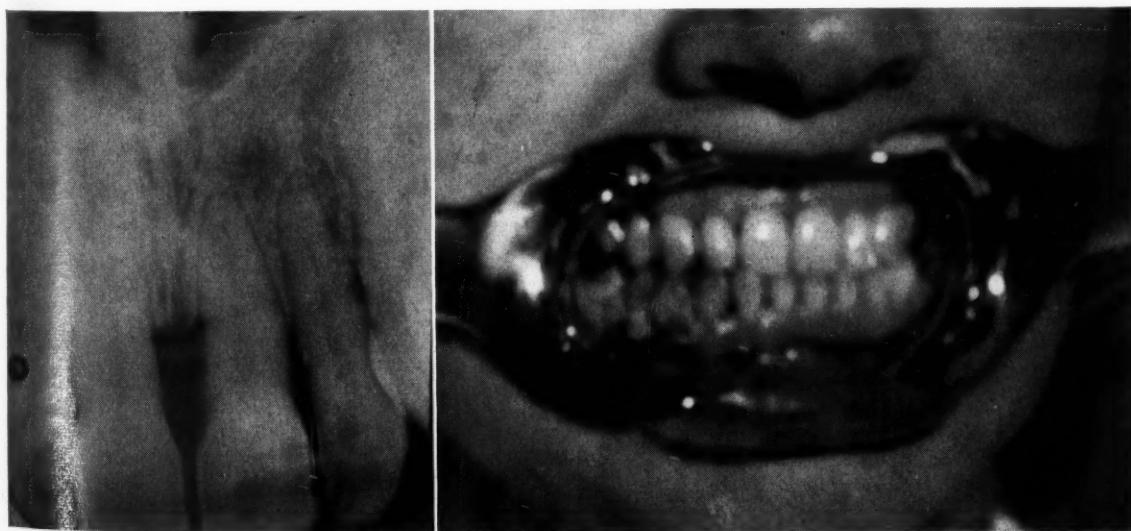
illustrated in Figures 3A and 3B.

Case Four—No results were promised or anticipated in this case. However, office records show that the space closure was complete in six months. The teeth will probably be in contact in a month or two and should remain so if periodontal health is maintained (Figs. 4 and 5).

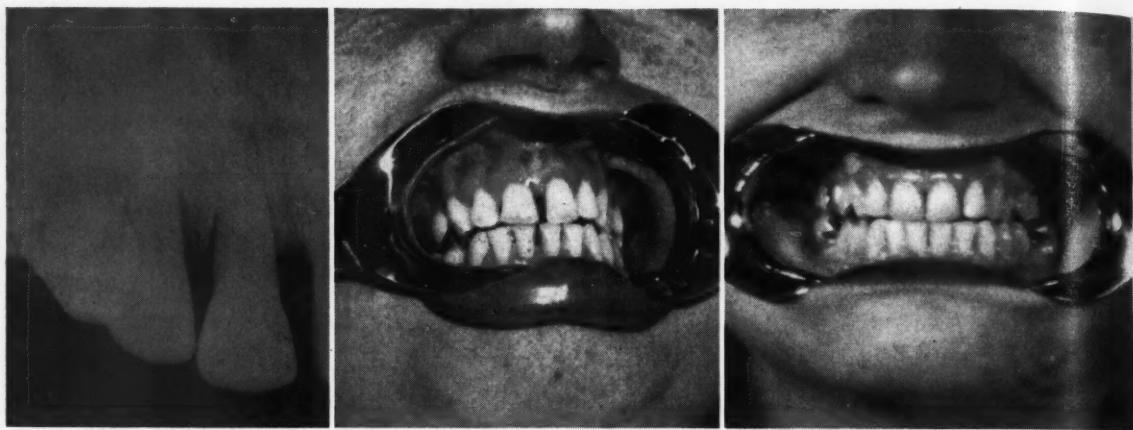
Case Five—While marked marginal bone regeneration has not yet been consistently demonstrated, Case Number Five presents radiographic evidence that in certain cases the alveolar margins do regenerate (Figs. 6 and 7).

The patient was resigned to the eventual loss of the teeth involved. They were loose but not uncomfortable, and the extractions were postponed.

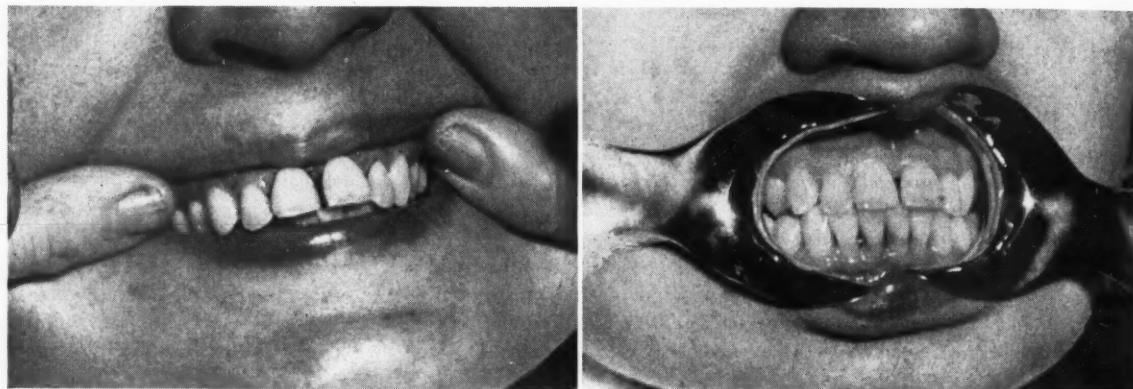
In this case the posteriors were amenable to treatment. Masses of detached infectious tissue were ex-



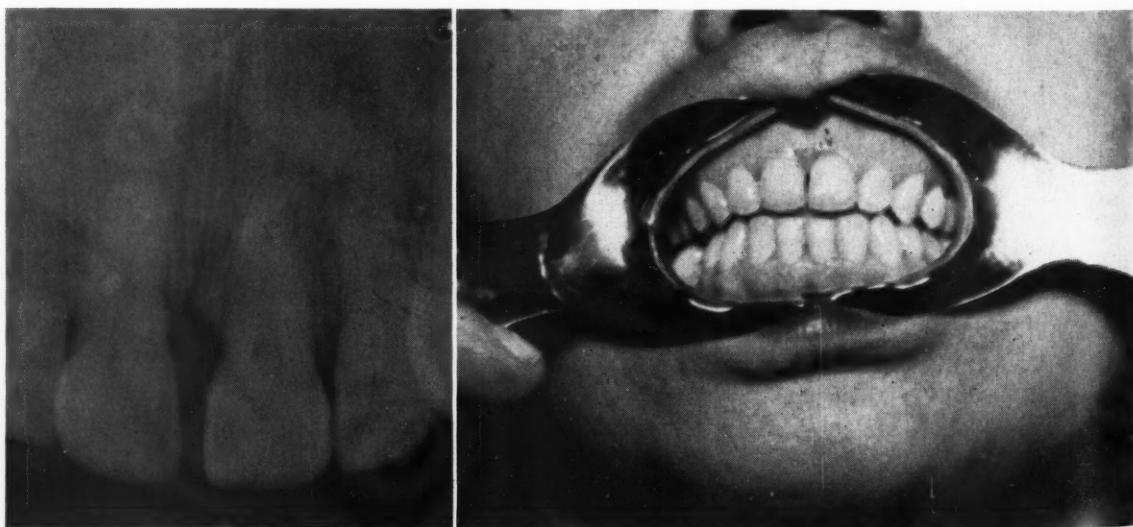
1A. Mrs. R, the patient described in Case 1, before treatment. **1B.** The same patient after treatment.



2A, 2B, and 2C. *The results of periodontal treatment in Case Two.*

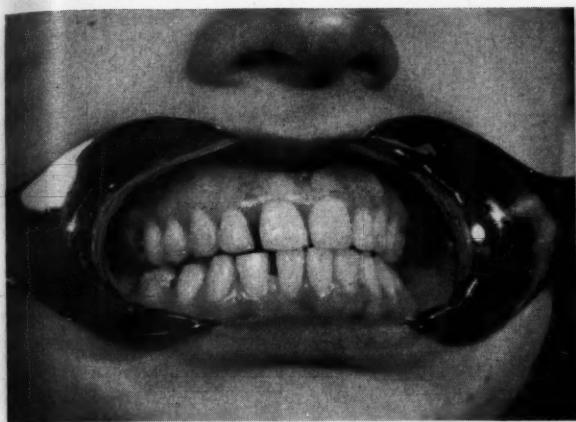


3A. *Mrs. S, the patient described in Case 3, before treatment. 3B.* *The same patient after treatment.*

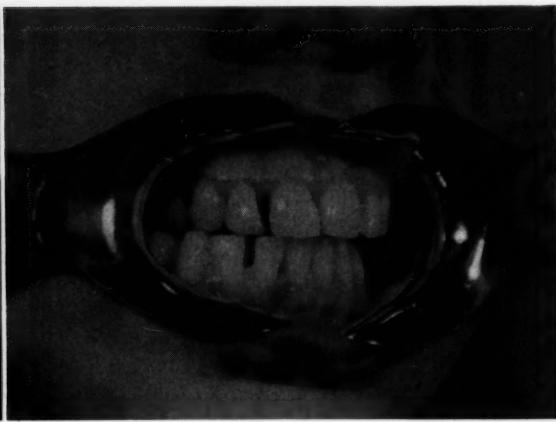


4. *Roentgenographic study of the patient described in Case Four before treatment.*

5. *Shows the results of treatment in the same patient after six months.*



6. Miss V, the patient in Case Five, before treatment.



7. The same patient one year later.

cised from about the neck of the anterior teeth as a preventive measure.

The patient, a young woman of 23, presented with marked spontaneous drifting. The case illustrates a number of points that are easily overlooked:

1. The usual surgical treatment and bite correction produced no visible results for the first six months except some tightening of the teeth which is important.

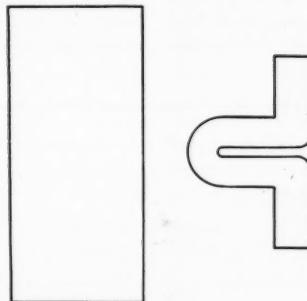
2. On further investigation it was found that the patient had a tongue-pressing habit, and also clenching habits. The tongue-pressing habit responded to autosuggestion but the bruxism did not.

3. Unobserved on early examination was extreme mobility of the mandible.²

4. The full set of x-rays showed both the vertical and horizontal type of resorption.

¹Boyens, Paul J.: Value of Autosuggestion in the Therapy of Bruxism and Other Biting Habits, *J.A.D.A.* **27**:1773-1777 (November) 1940.

²Elphinstone, J. L.: The Ultra Mobile Jaw, *Dental Cosmos* **73**:234-237 (March) 1931.



8. A simple device to be used between the teeth at night.

the stress. "Trauma usually is the mechanical activator of drifting bone resorption."

A Simple Device Used: Bite plugs made of gauze sponges dipped in paraffin were given to the patient (folded as shown in Figure 8) to use at night. This simple device is held between the teeth in the bicuspid region like a bitewing film reversed. An eight-inch string tied to it prevents swallowing it.

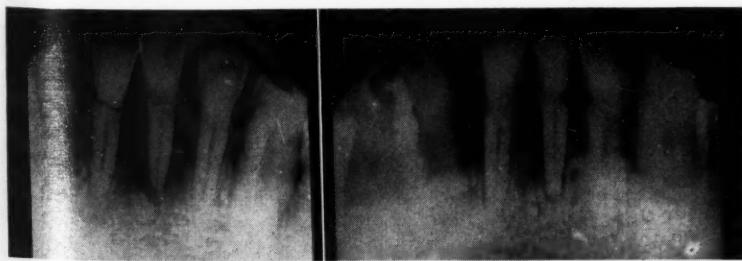
A slight closure of the space resulted from the use of the bite plugs at night but it must be remembered that elongations of the anterior teeth may result from prolonged use of this device.

As this case merited further study, the patient was referred to a physician for diagnosis and follow-up treatment.

Physical and Laboratory Results—

(1) Blood sugar, blood cholesterol, blood calcium, and blood phosphorus within normal limits. (2) Wasserman, negative. (3) Basal metabolic rate, minus 14 per cent³. (4) Fingernails chalky and brittle; patient's health otherwise was normal.

Treatment (Systemic)— 1. Thyroid extract and dicalcium were prescribed with adequate diet instructions. 2. High vitamin diet was stressed, supplemented with ascorbic acid to stimulate growth of collagenous fibers.⁴ (3) This patient will be

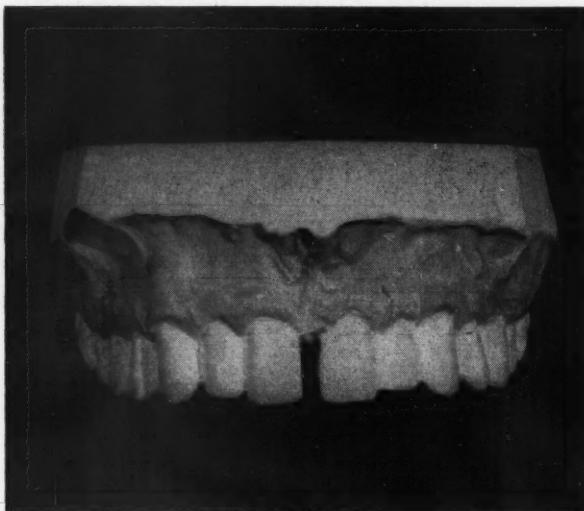


9. Mr. K, the patient described in Case Six, before treatment.

10. The same patient after treatment.

³Reynolds, Ralph A.: Relationships Between Endocrine Dysfunction and Parodontal Disease, *J.A.D.A.* **20**:1850-1858 (October) 1933.

⁴Wolbach, S. B., and Howe, P. R.: Intracellular Substance in Experimental Scorbustis, *Arch. Path.* **1**:124 (January) 1926.



11. *Diastemas of this type do not necessarily become pathologic. However, with a hyperplastic frenum, food friction, and tooth brush injury, they are extremely susceptible to pocket formation.*



12. *This illustrates the section where gingival tissue was removed from the palatal surface. More details of the technique are illustrated in succeeding photographs.*

kept under observation for an indefinite period as some factor more specific than trauma produced by extreme mandibular range may be diagnosed.

Case Six—While marked marginal bone regeneration has not yet been consistently demonstrated, Case Number Six presents radiographic evidence that the alveolar margins do regenerate in some cases (Figs. 9 and 10).

This patient was resigned to the eventual loss of the teeth involved. They were loose but not sore and wishing to temporize on further dental work the extractions were postponed.

In this case the posterior teeth were amenable to successful treatment. It was a simple operation to excise the masses of detached pathologic tissue from about the necks of the anterior teeth, which was done as an experiment.

Because of the patient's abnormal bite it was necessary to shorten the incisors from 2 to 3 millimeters to relieve pathologic tipping which occurs during mandibular excursions.

The Phenomena of Drifting Teeth

Among the anatomic changes in the normal evolution of a tooth

the following have a close relationship to (A) drifting, and (B) reversal of drifting:

1. The constant movement of the teeth toward the occlusal which is accelerated by trauma and periodontal disease.
2. Pull in the mesial direction by the interseptal and other fibers which tend to keep the teeth in contact, compensating for normal proximal wear of the entire dentition.

Significant Factors

1. Pathologic or pathogenic conditions interfere with the normal rate of eruption. Occlusal abuse is an important factor in the migration of a tooth. Sooner or later the tooth tends to extrude; hence the need for occlusal study.

2. More significant is the mesial pull which maintains contacts despite wear. However, this process is interfered with when periodontal disease occurs. The change in the normal process which may cause drifting is the following: The transeptal and other fibers (nature's own retainers) maintain tone in health only, whereas the periodontal lesion not only destroys these connecting fibers but the associated fibromatous masses tend to expand. Therefore, in disease the normal mesial pull is replaced by a

pushing force of the lesion (fibromatous masses or thickening membrane).

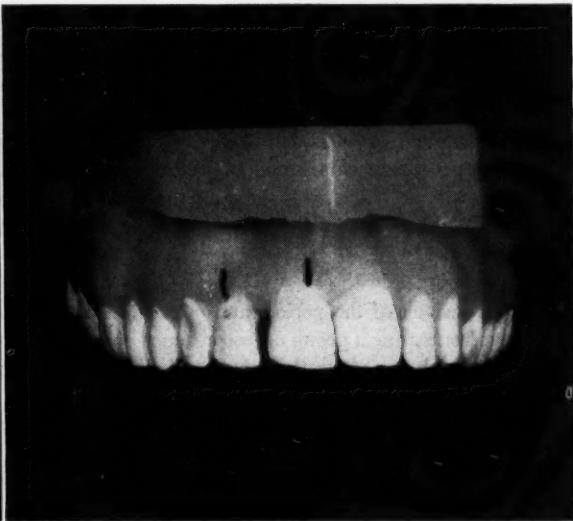
Technique for Treatment

The theories of the surgical and mechanical treatment are simple. However, in considering treatment it is well to be reminded of certain bone conditions:

1. In periodontal disease there are two main groups of systemic factors: (A) That group which primarily affects soft tissue, and (B) that which primarily affects the osseous structure.
2. It is osteodystrophy which must be dealt with in pathologic wandering. However, the inflammatory type is often superimposed on the dystrophic type, which modifies a favorable prognosis.

The difference between the technique described, which tends to reverse the process of pathologic drifting, and the more conservative surgical techniques which have been developed, lies in the matter of sequence.

Correction of Trauma—As occlusal trauma is usually the mechanical activating factor in pathologic drifting, ^{5, 6, 7, 8, 9, 10} its correction is logically the first step in treatment. Bite correction is not the complete



13. Showing the limit of the incisions involving the central and lateral diastema. Only four incisions are necessary. The vertical one next to the roots is made first; the blade is held flat against the root surfaces. The incision should extend to the alveolar margin. The two other vertical incisions start from the middle of the palatal surfaces of the lateral and central. These also extend to the alveolar margin and are carried palatally for about 9 millimeters, depending upon the amount of soft tissue involved. By mak-

ing the final transverse incision the section can usually be removed without leaving any ragged edges or tags. Thorough scaling and curetting must be done at this time.

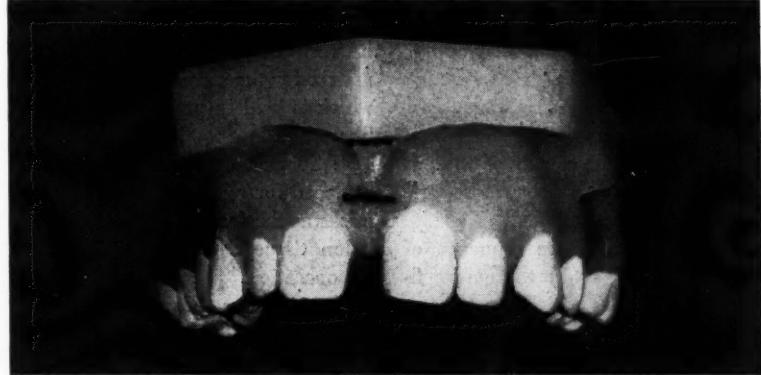
14. This figure shows the labial aspect of Figure 13. Subgingival scaling is done approximating the two vertical lines. If the gingival margins are hyperplastic they should be flattened at this time to protect them from future injury. Scaling these areas must be thorough, but delicate in order not to tear the gingival margins.

answer to the correction of occlusal trauma but it is an important factor.

Correction of Abnormal Biting Habits—Mandibular excursions are wide and variable. Especial attention, therefore, must be paid to extreme and abnormal movements which traumatize individual teeth. Patients seem to search for a weak tooth. Autosuggestion can be used as an aid in correcting abnormal biting habits.

Improvement Possible: While it is not always possible to produce an ideal bite, it can usually be so improved as to bring the pressures more nearly within physiologic limits.

Periodic Correction: Teeth change position. For this reason bite cor-



15. Attachment of the frenum or other muscle fibers in the region of the gingival margin is often a source of inflammation, pocket formation, and hypertrophy. The purpose of this unorthodox technique is to prevent an unsightly space. Severing the muscle fibers near the papilla without reducing the latter is a simple technique to crowd the fibers to a position indicated by the upper line. This tissue usually atrophies when irritation is removed. If it does not, it can be reduced later. To keep the fibers from reattaching themselves to the margin, wondrapak serves admirably in keeping the fibers back. Packing is put on in two sections, the first, locking between the teeth and acting as a matrix for the second and softer portion, is held in position to hold the fibers back.

Surgical dressing should be kept replaced for a period of two or three weeks as the formation of granulation tissue defeats the purpose of the operation.

Postoperative care consists of regular massaging with the rubber point and the careful use of the tape.

The only reason the surgical removal of detached labial is not advocated is for esthetic reasons; if indicated, surgery or cautery can always be used later.

⁸Becks, Hermann: Normal and Pathologic Pocket Formation, J.A.D.A. 16:2167-2188 (December) 1929.

⁹Becks, Hermann: Newer Aspects in Paradenosis, Ann. Int. Med. 6:65-71 (July) 1932.

¹⁰Gottlieb, Bernhard: Tissue Changes in Pyorrhoea, J.A.D.A. 14:2178-2207 (December) 1927.

¹¹Thoma, K. H.: Oral Diagnosis and Treatment Planning, Philadelphia, W. B. Saunders Company, 1936, p. 131.

¹²Kronfeld, Rudolf: Histopathology of the Teeth and Their Surrounding Structure, Philadelphia, Lea & Febiger, 1939, p. 315.

¹³Boyens, Paul J.: Factors in Various Types of Paradenosis, Dental Cosmos 77:1-11 (January) 1935.

rection should be done periodically. In grinding the anteriors (1) shorten and bevel the uppers as much as esthetics will permit, and (2) shorten the lowers enough to relieve stresses, even if the procedure entails conduction anesthesia.

Surgery

Most techniques in the removal of pathologic lesions of the periodontal tissue involve treating a group of teeth at a time which expedites the treatment. However, for the most satisfactory results in treatment for pathologic drifting, the following sequence of steps is suggested:

1. An isolated pocket (separation) is treated separately.

2. All the soft tissue is removed from the tooth involved on the palatal aspect only. This tissue is removed completely to the alveolar margin. It is not difficult to avoid the anterior palatine foramen.

3. Four incisions are made: Two vertical incisions along the root to the alveolar margin; one vertical transverse connecting the first two; and one horizontal transverse severing the section from the palatal surface.

4. If the labial aspect of the gingivae is hypertrophied it can be reduced, but usually the treatment consists of thorough scaling and polishing. This is done on half of the circumference adjacent to the separation.

The purpose of the sequence of steps described is (1) to remove fibromatous masses which exert a certain amount of lateral pressure, and

(2) to re-establish tissue tone which has a normal tendency to contract and thus draw the teeth together.

Treatment of Adjoining Teeth—To postpone counterpull, treatment of the adjoining teeth is not done until the contracting fibers have been re-established and tissue tone between the adjoining teeth is improved.

This operation can be used on any anterior teeth (Fig. 15). The vertical lines show the relative area of subgingival scaling. The labial aspect of the papilla is left intact. No labial tissue is removed unless it is hypertrophied.

Procedure—1. Attachment of the frenum or other muscle fibers in the proximity of the gingival margin is often a source of inflammation, pocket formation, and hypertrophy.

2. Severing the muscle fibers near the papilla without reducing the latter is a simple matter to crowd the fibers to a position indicated by the upper line. This tissue usually atrophies when irritation is removed. If it does not, it can be reduced at a later date.

3. To keep the fibers from reattaching themselves to the margin, wonderpak may be used. The packing is put on in two sections, the first locking between the teeth, and acting as a matrix for the second and softer part which is held in position to hold the fibers back.

4. Surgical dressing should be kept replaced for a period of two or three weeks as the formation of any granulation tissue defeats the purpose of the operation.

Postoperative Care—1. Regular massage with the rubber point and

careful use of dental tape is recommended.

2. Surgical removal of the detached labial is not advocated for esthetic reasons; if indicated, surgery or cautery can be applied later.

Results of Cases to Date

About forty operations with the described technique have been performed with the following results:

1. Of this number at least half showed spectacular results.

2. Two were failures. One of these was due to marked overbite combined with the inflammatory condition associated with frequent pregnancies. The other failure, an advanced case, probably was due to some undiagnosed systemic condition.

3. The remaining middle group was successful to the extent that all the teeth became tighter with some closure of the spaces.

Average time for space closing is from two to six months.

Conclusion

1. Many competent and conscientious dentists are skeptical of the results of all periodontal treatment.

2. As the theory and treatment of periodontal diseases is a vast field and presents many complex and controversial aspects, it is logical that differences of opinion should exist.

3. With succeeding improvements in treatment of periodontal disease, periodontists hope that more general practitioners will become interested in these particular problems.

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ORAL DYNAMICS (Part Four, Final Installment)

THOMAS H. FORDE, D.D.S., Washington, D.C.

DIGEST

Based on the premise that the lowest standard of efficiency of the natural teeth is far above the highest known standard of artificial dentures, this article describes in detail the biologic overload, the practical application of the two-dimensional plan of balance, and presents a complete technique for pedodontic applications of the theory of oral dynamics under discussion.

Departure From the Orthodox Concept of Balance

The Equation—For example, the working arm of the tooth demands a proportionate amount of bone in the supporting arm. The equation:

Working Arm=Supporting Arm must be observed or continued exfoliation will result.

The Point of Departure—Observance of the fundamental physical laws calls for an abrupt departure from the orthodox concept of balance, particularly by changing topography in appreciation of the inclined planes. Balanced occlusion, as presently enforced, is the line of first attack in the two-dimensional plan of balance.

Unilateral Balance Emphasized—The change in topography shows a deep respect for unilateral balance but unilateral balance is only one phase of the present-day dental concept that is retained in this process of thinking:

1. Bilateral balance is intentionally destroyed, first in natural dentition; and second in every subsequent step

the unilateral phase is emphasized while the bilateral phase is depreciated.

2. All forces working through the food morsel that can cause the expansion of the upper arch are removed, regardless of the relationship between the two jaws in operation.

Reduction of the Surface Area—The first criticism directed against the two-dimensional plan of balance may come from the realization that this plan requires reduction of the surface area. The masticating area of the lower arch is deliberately reduced in order to carry out the equation demanded by the law of the lever. On first examination of one of these cases, the dentist is likely to feel that the patient cannot properly masticate his food and is almost willing to forego correcting the violation in order to give temporary satisfaction that, in his own mind, he feels is necessary.

Mechanical Efficiency Increased—The main purpose here is to show that the reduction of surface area actually increases the mechanical efficiency of the power factors.

There is, however, a dimensional factor that enters into the equation. For example, if the mechanical surface of the striking member (mandibular) is reduced fifty per cent of the normal surface area, the patient can effectively compensate for this reduction by retaining the morsel of food in his mouth twice as long.

Prolonged Mastication Desirable—This is physiologically desirable: (1) The parotid glands have twice the time to produce ptyalin, (2) the sub-

lingual glands have more opportunity to secrete mucin, and (3) the bolus is sent to the stomach in excellent digestive form. It is, therefore, no concern to the dentist if his treatment causes the patient to spend more time in the act of mastication.

Food Preparation in Ideal Dentition—As a matter of fact, in the so-called ideal dentition with sharp interdigitating cusps, the morsel of food is poorly prepared, having received a few perforations, a slight mixture of ptyalin, a thin coating of mucin, and thus going to the stomach virtually unmasculated. This throws on the stomach the burden not only of digestion but the process of breaking down the food particles that should have been more completely prepared for the act of gastric digestion.

Dimensional Terminology—In this article forces are described by dimensional terminology. For example, (1) a relief of buccal thrusts on the upper teeth is strongly urged; (2) a concentration of lingual on the upper teeth is considered imperative.

There is, however, another force that enters into any dimensional description: the element of time. The amount of force applied in the normal dentition, if overused or misused, is hereby described as harmful and damaging.

The Element of Time—After these force patterns are corrected, however, the same efficiency in mastication is gained through the element of time. There is no destruction or injury to the periodontal membrane, regardless of how long the time dimension is extended. For this reason the privilege is assumed of removing buccal thrusts, concentrating on lingual

thrusts of the upper teeth, and at the same time reducing the surface area of the lower teeth to any extent that we see fit, leaving it to the patient to balance the equation of efficiency by prolonging the masticating act in handling of the food morsel.

Retention of the Natural Teeth
Advocated—Bridges or partial dentures are preferred to full dentures. Preventive dentistry assumes authority to do anything necessary to save the teeth, notwithstanding orthodox concepts. The intention is deliberate and without qualification to apply any technique that can protect the biologic structures.

This is justified on the basis that the lowest standard of efficiency of the natural teeth is still above the highest known standard of artificial dentures. The margin between natural teeth and artificial teeth is so great that no matter what the topography of the natural dentition may be, it is still superior to the perfect topography of artificial dentures.

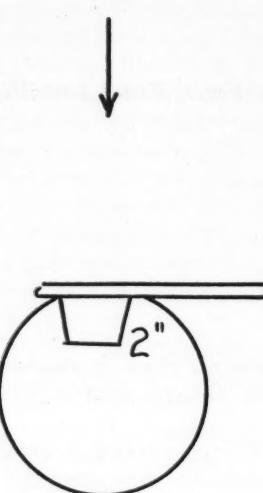
The Contest Between Orthodox and Progressive Concepts—While much of the present work is contrary to the orthodox concepts of dental technique, it is recognized that dental education is the direct result of traditional planning and empirical thinking. Concepts established through educational standards are accepted with deep faith by most students and an attack on traditional standards must therefore be made under protection of sufficient evidence to resist all efforts by present-day educators to destroy opposition.

Controversy is Wholesome—The attack and reaction is wholesome and welcome and for the sake of the dental profession as well as the general public, the argument should be conducted openly and directly with no opinion barred until the conclusion is reached.

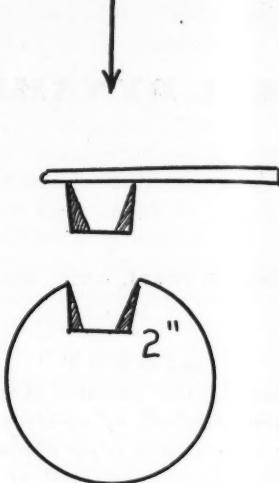
The Law of the Flying Wedge

Diagram 13 shows a circular resistive mass about to be struck with a wedge-shaped hammer. Using arbitrary values, if the blow exerted represents 150 pounds, it is possible to

150 lb.



75 lb.



13

calculate the depth of the cut, knowing the force applied and the resistance of the mass.

Still assuming arbitrary values, let us suppose that the cut will reach two inches in depth, using the full surface edge of the wedge as described and ignoring the shaded areas indicated in the diagram.

Under this law it is possible to remove that part shown in the diagram by shading, and automatically reduce the surface area of the cutting or striking edge. At the same time, the force applied could be reduced fifty per cent. The total depth of the cut would still be two inches.

However, in order to get the total length of the cut it would be necessary to strike again, for the pressure applied each time would be only 75 pounds. In other words, the full depth of the cut can be attained with half the pressure by using twice as many blows.

The Law is Axiomatic and Indisputable—As applied to the two-dimensional plan of balance, this law provides evidence that cannot be refuted by empirical thinking of adherents to the three-dimensional plan of balance. Any argument which ignores the fundamental laws has no validity in this discussion.

Character of the Cutting Surface

not an Essential Concern—The flying wedge is assumed to be a sharp cutting edge but the law itself is not concerned with the character of the cutting surface. A flat surface, energized by force, must follow the law regardless of the surface area.

However, the greatest lesson to be learned from the law is that the broader and bigger the surface area of the striking member, the greater must be the back pressure on the supporting roots. This discussion leads directly into one of the most important factors to be described: the biologic overload.

The Biologic Overload

Great emphasis has been placed upon bone metabolism. Every law possible has been cited to impress the reader with the importance of accepting the foundation presented as one end of an equation and the ultimate procedure as the other. The dentist has no right to try to increase the surface area of natural teeth, bridge abutments, bridge pontics, partial dentures, or full dentures beyond the limits that the biologic structures will stand.

A Common Dental Fault—Among the many violations of which present-day dental practice is guilty, the biologic overload is perhaps the most

common. It is strange, indeed, that because 28 teeth are carded for dentures the dentist and the technician feel morally bound to place them in the dentures, regardless of whether or not the mouth can take such a load. The surface area of pontics and partial dentures is invariably the full size of natural teeth, and with very few possible exceptions, there is an unqualified overload that will directly affect metabolism and cause a loss, whether in the natural tooth, a bridge, or a partial or full denture.

Importance of Masticating Ability Overemphasized—The average dentist is too much concerned with the masticating ability of his patient, placing it above all other factors in importance. He cannot realize that misuse or overuse of the biologic structures exacts a greater penalty than any patient would consciously pay.

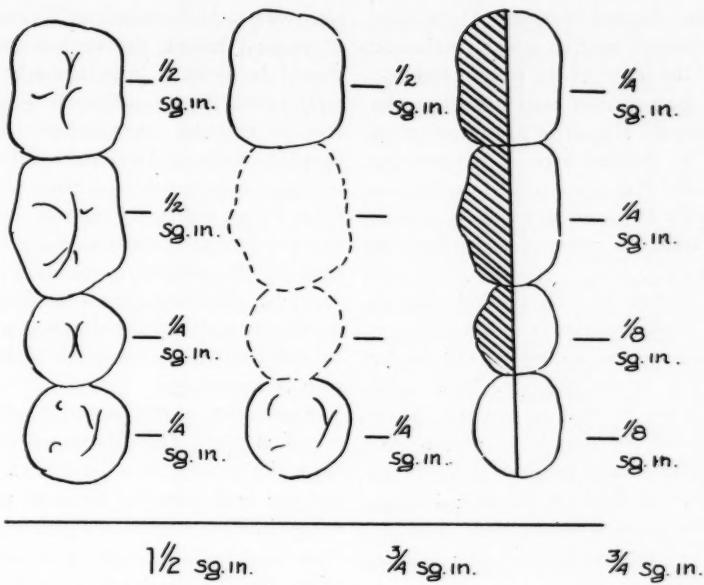
The change, therefore, from the three-dimensional plan of balance to the two-dimensional plan of balance, although drastic, must finally answer the mathematical equation that will eventually win, regardless of the opinions or procedures of the practicing dentist today.

Practical Application of the Two-Dimensional Plan of Balance

The distinct difference between the three-dimensional and the two-dimensional plan of balance should at this time be clearly evident. Summarizing: The principal difference remains in the total absence of all buccal thrusts. The application of this plan has been under constant discussion from the beginning of this article.

First Step in Conversion—Bite correction itself is the first act of conversion. The moment the mouth is freed from buccal thrusts on the upper teeth and lingual thrusts on the lower teeth, the apparatus is automatically thrown into a two-dimensional force plan of balance.

Concept of Force Pattern—This plan must be thought of strictly through the force pattern itself. Bite correction of a full complement of teeth is the first application of the



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plan. All phases of dentistry must undergo the same phases of treatment.

Reduction of Surface Area

Bridge Abutments and Pontics

The reduction of surface area must be limited to the striking member only. The size of the abutment and pontic is critical in the striking member but not in the receiving member. The pontic of the upper tooth, therefore, should be full size, with lingual extension wherever possible. The condensing action is more effective when carried out on the lingual planes of the upper posterior teeth.

For this reason the reduction of the surface area is applied to the lower teeth and must not be confused. To reduce an upper pontic would gain nothing and might restrict the condensing action if the lingual planes were not carried out to the greatest extension along the lingual surface of the teeth. All discussion will pertain to the lower posterior teeth.

Diagram 14—The occlusal topography of four lower posterior teeth is represented. In the first part of the diagram, showing the topography before the removal of the teeth, arbitrary values are selected to represent the total surface area of the lower

teeth. The molars represent $\frac{1}{2}$ square inch, while the bicuspids represent $\frac{1}{4}$ square inch. The total is calculated as shown in the diagram to be $1\frac{1}{2}$ square inches.

Diagram 14, Second Part—The dotted lines in the second part of the diagram indicate teeth that have been removed. In particular the amount of surface area is shown that was left on the two abutments that are to carry the bridge. The remaining area is calculated at $\frac{3}{4}$ square inch, as $\frac{3}{4}$ square inch was lost by removals.

Third Part—The bridges are shown in place with reduced area on the two abutments primarily, and the two pontics secondarily. However, the total load that the bridge can carry in square inches is no greater than the total load of the original abutments and is calculated in arbitrary values as $\frac{3}{4}$ square inch remaining.

Change in Operative Procedures—For the abutments operative procedures are changed from the use of inlays to the use of onlays. (1) Onlays, (2) full-crown castings, or (3) three-quarter castings are recommended for efficiency of the reduced surface area in the two-dimensional plan of balance. The remaining part

of the diagram suggests (1) the type of castings used on molar abutments, (2) the shape of the pontic, and (3) the three-quarter casting used on the bicuspids. Operative procedures need not be detailed here. It is taken for granted that any qualified dentist can execute the necessary preparation to provide the patterns prescribed by this plan.

Diagram 15—The lateral view of the bridge pontics is shown with emphasis on the spillways, (S) under Part C of the diagram. These spillways are of vital importance. Their essential function is to prevent the transfer of any pressure through the morsel of food on the buccal cusps of the upper opposing tooth, whether it be a natural tooth, bridge pontic, or denture.

Restorative Dentistry Involving Bite Elevations

The need for correcting the vertical components cannot be overemphasized in mouth rehabilitation. Such correction, however, must be accomplished within the limits of the physical and biologic laws. The first step in re-establishing the vertical component, by adding to the working arm of a tooth, is basically wrong. Therefore, knowing that this procedure must be done in direct violation of the fundamental law of the lever, it is necessary to show the means through which it can be accomplished with the least degree of violation.

Discussion Restricted to Cases Showing Little or no Bone Loss—All cases showing progressive bone loss indicate that the working arm is already too great for the supporting arm; any attempt to use fixed restorative measures in these cases will accelerate the loss of the teeth through increasing the mechanical load which is already beyond tolerance. Therefore, this discussion will be limited to cases that can qualify for fixed restorative procedures by virtue of showing little or no bone loss.

Occclusal Platform Reduced—Bite elevation is the recommended procedure provided the surface area is reduced in proportion to the increase in vertical height. For example, if the

bite were to be opened 2 millimeters in vertical height, the surface area should be reduced approximately 2 millimeters. If a 4-millimeter elevation is required, the surface area should be reduced 4 millimeters. This increase reduces the occlusal platform to an extremely narrow area and requires the patient to use more time in the proper mastication of food. (1) The biologic overload will be absent, and (2) the violation will be reduced to the minimum if this plan is carried out.

Application of the Law of the Flying Wedge—1. These bites will not close, the upper arch will not expand, and the teeth carrying the load will not exfoliate. 2. The reduced platform on the occlusal surface operates under the law of the flying cleaver and passes through the food morsel with the greatest of ease. In effect, this is equivalent to sharpening the teeth. 3. The back pressure on the supporting roots is reduced in proportion to the reduction in the surface area. The patient can pierce the food morsel with much less power than that required when the tooth possesses its full surface area. 4. Taking advantage of the law of the flying wedge, the violations previously mentioned are reduced to a minimum and can be reconciled in a metabolic adjustment through bone compensation. 5. This is the reward for carrying out a procedure that visually appears wrong but operates successfully throughout the life of the patient.

Types of Procedure—1. Operative procedure calls for onlays, full castings, or three-quarter crowns. 2. Inlays are completely impractical and cannot be used in this plan. 3. Any restoration of full occlusal anatomy,

extending the working arm of the tooth, is absolutely wrong; few patients will withstand the abusive violations of the fundamental law of the lever with resulting reversal of bone metabolism.

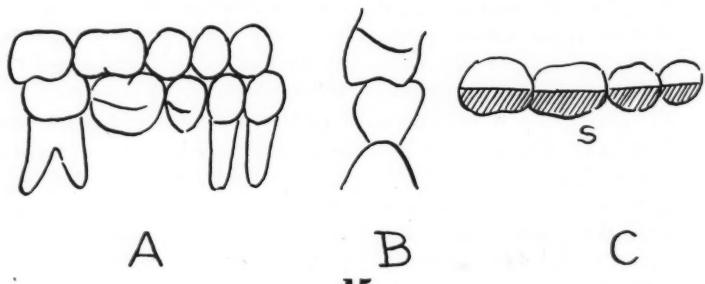
The Use of Splints: The cases that cannot qualify for fixed restorative measures are many indeed. They must be corrected by splints, providing the same topography as described for fixed measures but allowing far more latitude in elevating the bite. The only objection to the splint is the possibility of etching and promoting caries beneath the occlusal surfaces on which the splint rests.

The Use of Castings: In exaggerated demineralization where the caries index is high, it is necessary to use castings first and then apply the splint to the immune areas established by the casting.

Objections Nullified: Many dentists object to a double procedure requiring both castings and splints, feeling that it is laborious as well as costly to the patient. This criticism cannot be accepted because any increase in the working arm of a tooth that is already in the process of exfoliation will accelerate its loss. The patient must be protected against procedures that are basically incorrect.

Diagram 16—A series of four pilings driven into sand are shown, indicating the amount extending above the sand as the working arm and that part buried in the sand as the supporting arm.

The reader is asked to visualize stepping on each individual piling, throwing the entire weight of the body on each step taken. In these circumstances, the working arm transfers the entire strain to the supporting arm; if the balance between the



two is correct, the piling will withstand the load without damage. But if the sand should wash away, as indicated by the dotted line, walking on the piling would be hazardous and could result in displacement or even total destruction of the piling.

Part B, Diagram 16—A board is placed across the pilings. It makes little difference whether the board is four inches in height or two inches. A man could walk successfully along the plank, transferring his weight proportionately at all times to more than one piling, and even if the sand had washed to the dotted line, the probability that the piling could take the load is highly favorable.

The Elementary Rules of Physics—This simple sketch is introduced with the intention of taking the reader's mind entirely off the subject of dentistry and confronting it with the elementary rules of physics. It is impossible to add to the length of the pilings in the first sketch if the sand is already washed below the margin of safety. To do so would be a flagrant violation and completely outlawed in all scientific procedure. Yet this error is committed in the mouth without being criticized by any member of the dental profession.

Bite Correction Should be Instituted Early—1. Criticism directed against a splint is justified if the splint is placed in the mouth without warning to the patient as to the possible damage it will do unless it receives immaculate care. Even then, in many instances, the teeth will etch and caries will occur after the first three years.

2. It is far better to institute bite correction early in life than to wait until the condition necessitates methods which do carry liabilities or elaborate operative procedures prior to placing the splint. The judgment of the dentist must be exercised to decide whether he can leave this liability in the hands of the patient or perform the operative procedures before the splint is placed in the mouth.

Pedodontic Application

There is a definite place for this technique in children's dentistry. With

modern diet and modern pediatric guidance of mothers deformities increasingly develop in children's teeth. Collapsed bites are readily recognized in children at an extremely early age. This deformity can be detected at three and one half to four years of age, and at seven or eight it is evident on casual observation.

Inadequacies of Bottle Feeding—Modern mothers have not the proper attitude for breast feeding and it is possible that modern medicine is a little impatient concerning breast feeding. Bottle feeding of infants is so prevalent and so inadequate that the oral deformities resulting therefrom should be more than lightly considered. The "muzzle snuggle" stimulus an infant derives from the proper breast feeding is of utmost importance for harmonious facial and oral development. Artificial nipples only induce sucking reflex and contribute virtually nothing to the development of the face and oral cavity. All types of nipples offered for commercial sale today are totally inadequate.

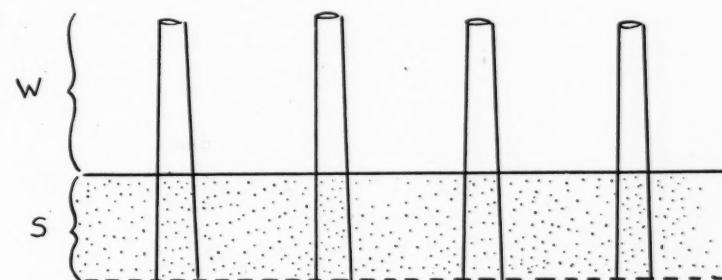
Possible Advantages of Thumb Sucking—With due regard for the firm opinion of the orthodontists con-

cerning thumbsucking, in the present school of thought it is sometimes highly advocated for premaxillary development. It is the author's opinion that children of today who evidently derive pleasure from hand-mouth stimulus are only problematic because they are trying vainly to compensate for lack of proper breast feeding.

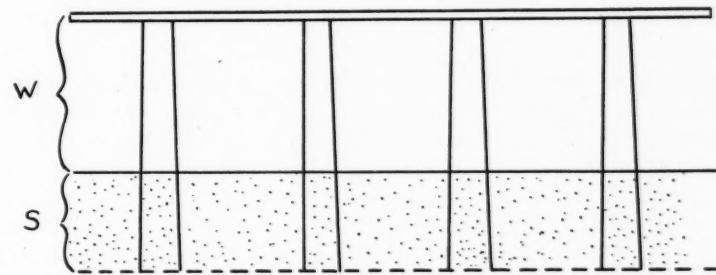
The Common Mouth Deformities of Children—(1) Anterior hypofunction (disuse atrophy), (2) anterior hyperfunction, (3) spaced central incisors (diastema), (4) permanent dentition too large for expected adult development, (5) collapsed bite, (6) insufficient vertical height, (7) development of deciduous teeth wherein the teeth have not established a proper vertical height and thus have failed to allow necessary cubical content for the tongue in the mouth, (8) malposed teeth, (9) mixed deciduous and permanent dentition, in reference to age and roentgenologic value, (10) deformities resulting from early loss of deciduous teeth with no authority of dental recognition and forethought, and (11) auditory loss concerning condylar impingement.

All these deformities are increasingly prevalent and only persistent

A



B



observation can determine dental procedures necessary to prevent defects in adult life.

Operative Dental Treatment—The difficulties arising from simple baby dental operative work in the general practitioner's office today are largely due to an absolute misdiagnosis: 1. Collapsed bites in children will destroy even the most simple occlusal lock cavity. 2. The amalgam restoration will bounce out of the occlusal periphery. 3. Mesial and distal axial portions of deciduous proximal amalgam restorations are readily destroyed. 4. Restorations of simple amalgams are doomed if this deficient vertical height is not recognized.

The Dentist's Responsibility—The difficulties arising from seemingly simple operative procedure are not necessarily the fault of the dental operator *per se*. It is responsibility to recognize this particular defect with children. This information is given with due regard to textbook cavity preparations and the most scientific modern dental techniques.

Recommendations—Perhaps the best recommendation for the child with a collapsed bite and cavities of the deciduous first and second molars is a thorough diagnosis as to bite equivalent, entirely disregarding caries for the present. A highly desirable procedure would be to give children as thorough a general diagnosis as possible, with full recognition of the dental conditions *in toto*.

From the ages of six to eleven bite-raising would be the ideal treatment for this prevalent defect: 1. Unilateral castings are elevated to the desired vertical dimension. 2. These castings are placed on the caries-free or caries-sterile first and second lower molars, thus permitting the establishment of the approximate vertical dimension for the particular age group. 3. The first permanent molars follow the path of least resistance and will establish the permanent bite for the diagnostic age of the patient. 4. These castings are not removed until exfoliation of the respective deciduous teeth is indicated. 5. The castings on each side are made into one-piece castings, with a decided interproximal thinness for

the purpose of individual exfoliation of indeterminate first or second deciduous molars.

Purpose of Bite-Raising—Bite-raising in all deciduous or partly deciduous permanent dentition cases is performed according to the *three-dimensional* plan of balance. Its purpose in childhood is to permit arch expansion in the natural pattern of growth. *It must be noted, however, that the three-dimensional plan of balance is observed only in deciduous cases.*

Treatment for Multiple Deformities—Modern techniques for inlays, simple acrylic space maintainers, and the like are employed where multiple deformities are involved. Observation of tooth exfoliation and eruption according to the pattern of chronologic and roentgenologic age will be of the greatest benefit for pediatrics. Extraction of the permanent bicuspid teeth at the age of eleven to thirteen should be strongly recommended in order to simplify correction of the adult dentition.

Incomplete Eruption of Permanent Teeth—If the goal of lifetime retention of permanent teeth for every normal human being is to be achieved, the opportunities for preventive dentistry in childhood cannot be overlooked. In the growing child the deciduous teeth not only perform the function of mastication but (1) set the foundation for permanent teeth, and (2) maintain progressive bone growth throughout adolescence. It is therefore of utmost importance to emphasize the corrective measures that can be applied in childhood dentition.

Vertical Dimension Established in Childhood—Collapsed bites, previously discussed, are recognizable in early childhood and establish a vertical dimension that more or less fixes the relationship between the two jaws. This cannot, despite many opinions to the contrary, increase its vertical dimension through the eruption of permanent teeth. *Whatever level is established through the infant dentition will be the ultimate level of the permanent dentition.* For this reason, many adults have a complement of posterior teeth that are not fully

erupted while the anteriors display normal elongation. Teeth which are not fully erupted present poor prospects for the retention of splints and appliances that are used in gaining biologic opening.

Factors Influencing the Eruption of Teeth—1. The first permanent molars must erupt under conditions established by the deciduous teeth and must accept the elevation that existed in the mouth at the time of their eruption. If these teeth cannot attain their proper length, all succeeding posterior teeth must survive under these conditions. 2. The bicuspids will come into contact with the opposing teeth and arrest all further development. 3. The second molars invariably erupt off the maxillary ridge, and before the adult dentition is completely formed the upper arch is already overexpanded in its last two posterior members. 4. The third molar must erupt on an axial alignment that sets its buccal cusp directly into the mucous lining of the cheek. In such cases a thorough examination includes study models without which the deformity may be overlooked.

Procedure: Bite elevation gained at the expense of the deciduous teeth is a highly recommended procedure and literally forces the deciduous teeth to fulfill their complete function in relation to the proper vertical component. Operatively, gold castings placed upon caries-free deciduous molars eliminate further caries and prevent premature loss.

Enlarged Space for the Tongue: Gaining bite elevation and the procedure described permits many natural possibilities for correction of future orthodontic cases. First of all, it allows more space for the tongue in its natural rest position within the oral cavity. This biologic factor alone is priceless in the natural arch formation of both the upper and lower anterior teeth. The collapsed bite forces the tongue to rest deep in the throat cavity and contributes largely to adenoidal and tonsilar complications that are so commonly found in childhood.

The Tongue a Factor in Normal

Expansion: Other factors are of biologic value because the tongue itself plays an important part in the normal expansion of both arches. As the tongue grows, the arch must grow in relation with it. The inclined planes, as previously described, are expanding factors in the human dentition; but the value of the tongue and its proper place in the mouth must never be ignored.

Advantage of Elevating the Bite on Deciduous Teeth—The simple castings described above are placed upon the deciduous teeth without any operative procedure whatsoever. This makes the vertical component a relatively easy factor to deal with. By simply elevating the bite on the deciduous teeth the first molars are permitted to attain their proper height. This height, once established in childhood by the permanent molars, is permanently maintained and permits all other lower posterior teeth to come into position with their full elongation and to set the foundation for the adult dentition. This can change only through failure to place the patient under the guardian protection of bite correction at the proper time.

A Major Dental Problem—The collapsed bite in adult life is a major problem of the dental profession. Restorative measures that are commonly used to gain the proper vertical dimension are expensive and laborious, not only for the dentist but for the patient who must undergo this type of operative procedure. This adult problem could be avoided by means of the relatively simple procedure described, instituted at the proper age in childhood when the biologic growth periods provide abundant energy.

Congenital Absence of Permanent Teeth—The treatment of diastema, over-developed arches, and congenitally missing teeth, if they are recognized in time, is not too involved. The result is never perfect, but the functional aspect can be maintained and the esthetics will be more satisfactory than if the condition were allowed to develop without treatment.

The Teeth Brought into Contact:

The condensing action of the appliances is recommended to bring the teeth into contact. In the commonest of all the congenital losses (the upper laterals) it is possible to direct the cuspids into lateral positions and grind them to resemble laterals. The result is not unfavorable from either a functional or an esthetic standpoint. If conditions make this procedure inadvisable, an alternative is to set the centrals together and gain sufficient space between the centrals and the cuspids for a bridge.

Adult Problems Predicted: Early surveys of childhood dentitions are extremely important to reveal the condition that must be dealt with early in adult life. Embarrassing, indeed, must be the position of a dentist who has cared for a child through his early life when he realizes that he is not informed on the lack of permanent teeth. His responsibility in guiding the dental life of the child certainly demands a greater interest than restoring cavities and leaving the rest to nature.

Over-Retention and Under-Retention of Deciduous Teeth—The over-retention of deciduous teeth is not a serious complaint but it is not to be ignored. The deciduous teeth have at least performed a vital function in remaining in the arch during the growth period. Under-retention contributes to deformities that will require orthodontic procedure; such a condition, therefore, indicates laxity on the part of the dentist who has assumed responsibility as guardian of the dental life of a child. In discussing over-retention it is well to emphasize the importance of maintaining a complete x-ray and study-model history of the child, especially through the critical period of exfoliation of deciduous teeth.

Under-Retention—Early loss of deciduous teeth before their function has been fulfilled is a dental tragedy and in many instances complicates the orthodontic problem to such a degree that it is almost untreatable. The dental profession cannot be directly blamed for these conditions. Indirectly, however, the failure of the dentist to educate the public as to the value

of deciduous teeth must be assumed as a part of his responsibility. Many parents feel that as the teeth will eventually be lost anyway, dental restoration is unnecessary. Parents will remain in a state of ignorance unless an educational program succeeds in informing them of the value of the deciduous dentition.

Loss of the Arch Phenomenon—Physicians often use arbitrary and unwarranted interference in dentistry regarding the retention of deciduous teeth. The removal of a deciduous tooth has the same categorical complication as taking a link out of a very important chain. The loss of the arch phenomenon is more serious in child life than in adult life because the growth period ceases with the loss of a tooth.

Responsibility for Results—The crowding that results from these complications must in time fall as a direct responsibility to the dental profession. Any physician advocating the removal of deciduous teeth should be held responsible for the result if the dentist does not assume the responsibility.

Measures for Retention—Available pharmaceutic preparations are sufficient to control the deciduous abscesses and provide retention until the permanent tooth can assume the position occupied by the deciduous tooth. Should removal be indicated, a space maintainer should be inserted immediately. This is a preventive measure which carries out the biologic requirements and maintains continuity of the arch phenomenon.

Auditory Involvement—The deciduous teeth set the pattern for the permanent arch and at the same time control the position of the condyles in relation to the auditory mechanism. Position of the condyle is the result of the deciduous positioning and by no means the controlling factor. It must be considered as the effect and not the cause. This position represents one-half of the equation of force. The masseter muscle divides the impact blow; half is absorbed through the deciduous posteriors and the other half through the meniscus, which protects the condyle.

Condylar Guidance—Most dental literature speaks of condylar guidance as the controlling factor. It must be noted, however, that condylar travel and position are the result of applied force transferred through the masticating muscles and established biologically as one-half of the total equation in force dissipation. Therefore, any deformity or early loss of the deciduous tooth is far more serious than mere visual aspects would indicate.

Biologic Adjustment in Disturbance of the Equation Factor—Condylar impingement is the result of the biologic adjustment that must take place when one-half of the equation factor is disturbed. If the deciduous teeth are missing on one side of the lower or upper jaw, or both, the angle between the ramus and the body of the mandible must adjust itself biologically. This adjustment means that the angle will become more oblique due to plasticity of bone. The lower jaw will bend and the masseter will tend to draw the angle of the mandible toward the tuberosity of the maxilla.

Displacement of the Condyle—The increased obliquity displaces the condyle and forces it backward toward the external meatus. If the cranial development at this stage of life is not far enough advanced, this impingement may strike in any position that can transfer the powerful impact of mastication through the hearing apparatus with destructive force. This may eventually destroy the sense of hearing.

Disuse Atrophy (Anterior Hypofunction)

Throughout this work emphasis has been placed on correct function of the teeth, not only for masticating efficiency but for the stimulus that is necessary to maintain proper blood supply to the roots and supporting structures. *No part of the human body can remain healthy without functioning under the laws it was designed to observe.* In the teeth, disuse or partial use lays the foundation for fatigue and destruction by robbing bone and tissue of the vital enrichment that

can be provided only through active blood supply. Grinding serves (1) to eliminate fatigue, (2) to control arch expansion, and (3) to restore the proper balance between the anabolic and catabolic phases of metabolism.

Teeth Most Commonly Involved—Anterior teeth are perhaps most commonly involved in the problem of disuse violation. Many cases present posterior teeth completely out of line and in a state of disuse, but anterior malposition and disuse constitute the majority of disuse atrophy cases.

Early Elimination Possible—Hereditary factors that bring about these conditions are treatable at almost any time through adolescence and early adult life. However, many of these unsightly deformities could be eliminated at eleven years of age through the removal of the first bicuspids. This may not entirely correct the deformity but it reduces the complications and makes relatively simple a case which would otherwise be completely untreatable. This surgical procedure, therefore, is labeled Number 1 in the preventive therapy for deformities that produce disuse atrophy.

Surgical Treatment—1. Crowded lower anterior teeth respond to the same surgical treatment if the lower central is selected for removal at the proper time. 2. Upper premaxillary deformities are controlled by the removal of one or two of the first bicuspids. 3. In many instances, the removal of the lateral is recommended. 4. The bicuspids, however, no matter how conspicuous their alinement, should never be removed. Removal of the first bicuspids at the proper time will allow these teeth to position themselves so perfectly that the loss of the bicuspid is hardly noticeable, even to the eye of the expert dentist.

Factors in Bite Correction—Bite correction involves (1) the expanding function of the upper posterior teeth, and (2) it also includes leveling the anterior teeth, so that the impact blow delivered in the act of incision is distributed across all the lower incisors.

In some cases this condition may be impossible to achieve but the ideal must be approached as nearly as hu-

manly possible. It is mandatory to distribute the impact of the cutting act among all the lower anterior teeth including the canines if possible.

Biologic Preparation for Function—To the dentist interested in bringing into function teeth that have been in a state of disuse atrophy, a warning must be given: 1. The teeth in question should be brought within half a millimeter of the functional requirements but not into complete function in the first grinding operation.

2. The teeth should be permitted to season themselves for the severity that they must eventually withstand and should be allowed to approach the cutting act gradually over a period of several months before they are finally brought into position where they can enjoy the full power of the masticating muscle on incision. There is a possibility of failure on the part of the teeth, particularly the lower teeth, to accept the responsibility of incision if this function is thrown upon them without some biologic preparation.

Adult Orthodontia Procedures—Posterior teeth in a state of disuse atrophy must be brought into function through adult orthodontia procedures. In this situation, expanding the arch is completely out of the question unless the posterior teeth are inclined lingually to an undesirable position on the arch.

In these extremely rare cases, an expanding appliance is used; but in all other cases, the restoration of the tooth when buccally inclined is gained (1) by removing a tooth, or (2) by slicing other teeth in order to restore the malformed tooth to its proper position.

Anticipation of Restorative Measures—1. Interproximal slicing is done at the expense of fillings when possible, but there should be no hesitation in slicing perfect teeth, anticipating restorative measures as the direct result. 2. The governing biologic law decrees that unless a tooth is restored to function it will be lost by the process of exfoliation and a bridge must be installed to replace it.

The Factor to be Emphasized—The

multiple deformities that produce disuse atrophy cannot be covered in this article. They are treated by obvious means. The main factor emphasized here is that all varieties of disuse atrophy, wherever found, must be treated and all teeth must be brought into function even though it is necessary to reduce the number of teeth in the arch to gain the objective. Adult orthodontia is a definite part of this procedure and is preventive in character. It is not done for esthetic value; it is done as a health measure in order to restore the proper blood supply through function. However, the esthetic result is highly favorable and is the natural accretion attained from complete function.

Hyperfunction

Disuse atrophy represents one extreme in the combination of mouth deformities while hyperfunction represents the other extreme in the condition of misuse. The powerful muscles of mastication operate with mechanical abuse against the biologic structures that support the permanent teeth. The childhood dentition shows the pattern through which the permanent teeth must travel; preventive procedures, as outlined, can modulate this deformity even though they do not totally correct it:

1. The collapsed bite forces the

lower anterior teeth to develop lingually and to lose their natural anatomic position. Vertical correction, instituted at the proper time, would secure this natural anatomic position.

2. The importance of the tongue position must be stressed as one of the powerful devices Nature has designed to gain the desirable position of the tooth. The lower anterior teeth are forced by position and use to accept an alinement that is directed lingually to the natural position. This invariably permits the lower cuspids to project in such a way that the normal act of incision is impossible. To achieve the cutting act, the lower jaw is protruded and the shearing act is developed between the upper and lower teeth. This satisfies the demand of the subject who accepts the deformity because he is completely unaware of anything that would be more desirable from the standpoint of efficiency or esthetics.

Adult Treatment Possible—If the opportunity of correction between the ages of eight and ten is overlooked the patient must face the complications of adult orthodontia, which invariably demands the removal of one of the lower centrals or both lower first bicuspids. These cases are treatable if the patient is prepared to accept not only the financial responsibility but also the unpleasant period of correction that is necessary to

reposition the teeth to serve in the way intended.

Question to be Answered—Hyperfunction is by no means limited to the lower anterior teeth. It naturally involves the opposing upper anterior teeth and every posterior tooth that is forced to engage in function under the conditions that hyperfunction describes. The complications that accompany this condition have already been mentioned in this connection with mechanical abuses and injuries to the anabolic phase of metabolism. The imperative need for correction has been amply stressed. The question to be decided by the dental profession is, Shall the correction be instituted in childhood or left until adulthood?

Conclusion

Preventive dentistry is a highly specialized field in which pioneering is still needed. The complex dental problems of the present age offer a challenge and the success of the dental profession depends on its ability to meet that challenge. The author, in presenting the results of his experiences and observations in this field, makes no pretense of exhaustive research. If these articles serve to stimulate interest and inspire further study, they will have achieved their aim.

5510 16th Street, N.W.

Dental Meeting Dates

Florida State Dental Association, regular meeting, Hollywood, Florida, April 29-May 2.

Kansas State Dental Association, regular meeting, Wichita, May 6-9.

Iowa State Dental Association, regular meeting, Des Moines, May 7-9.

Maryland State Dental Association, regular meeting, Baltimore, May 7-9.

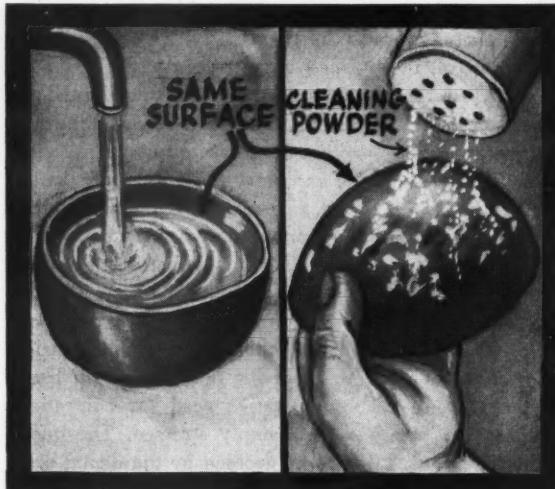
Illinois State Dental Association, regular meeting, Peoria, May 7-10.

Indiana State Dental Association, regular meeting, Indianapolis, May 21-23.

The Sigma Epsilon Delta Fraternity, golden anniversary meeting, Totem Lodge, N. Y., May 25-27.

The Connecticut Dental Commission, regular meeting, Hartford, June 19-23. For information write to Doctor Clarence G. Brooks, New London, Connecticut.

American Academy of Dental Medicine, fifth annual meeting, Hotel Dennis, Atlantic City, New Jersey, June 22-24.



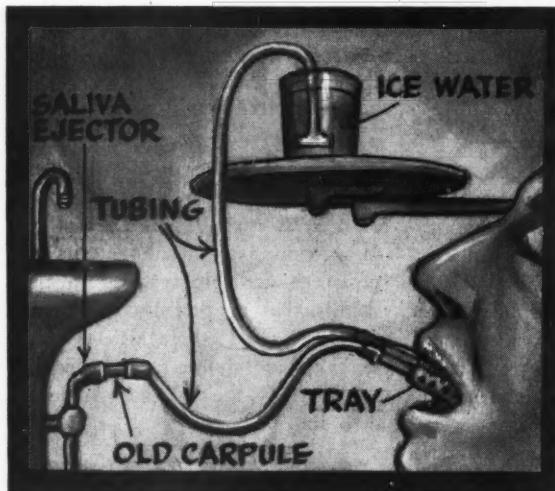
1

Clinical and Laboratory

Removing Alginate From the Plaster Bowl

R. L. Bishop, D.D.S., Youngstown, Ohio

1. Turn the rubber bowl inside out. Wet the surface thoroughly. Sprinkle any cleaning powder, such as Dutch Cleanser, over the surface. Rub briskly with the hand. By this procedure all the alginate clinging to the bowl will be removed.

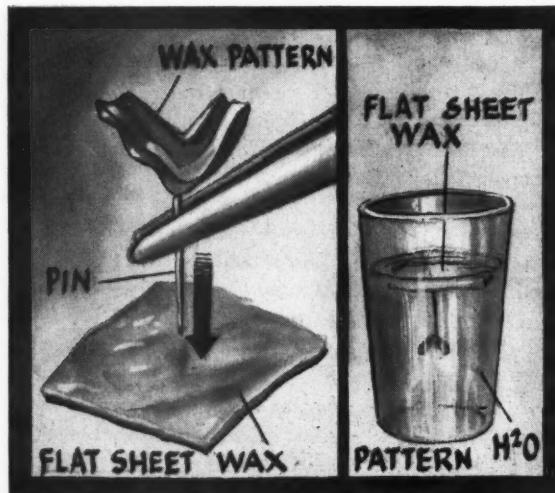


2

A Method of Cooling Hydrocolloid Impressions

William B. Lee, D.D.S., St. Louis

2. Fill a pan with ice water and place it on the bracket table. One piece of rubber tubing from the tray is connected to the saliva ejector. The other extends into the ice water. After the impression is in position, turn on the saliva ejector. The flow of ice water through the tray begins immediately.



3

Protection of Inlay Patterns

R. J. Costa, D.D.S., Brooklyn

3. To protect a wax pattern before it can be invested, insert the sprue pin in a piece of sheet wax. Place the pattern in a cup of water. The sheet wax will float on the surface of the water and the pattern will not touch the sides of the cup.

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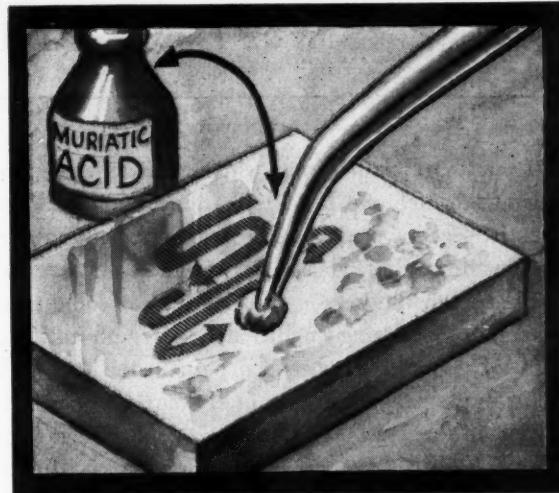
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

Removing Stains From Cement Slabs

Bernard A. Widen, D.D.S., Chicago

4. Dip a pellet of cotton in hydrochloric or muriatic acid and rub well over the surface of the glass slab. Wash the slab thoroughly in water. When dry it will be free from stains and residual cement.

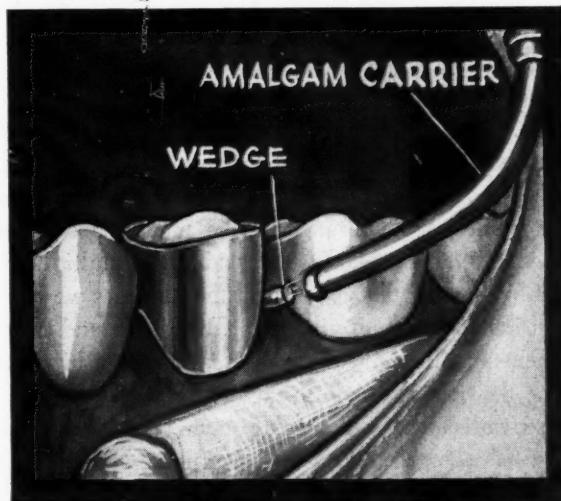


4

Insertion of an Interproximal Wedge

Raymond W. Deeney, D.D.S., Perry, N.Y.

5. An interproximal wedge may be carried to position and inserted by using a spring type amalgam carrier.



5

Applying Sodium Fluoride Solution

J. J. Donovan, D.D.S., Casper, Wyoming

6. After completing the prophylaxis with a rubber cup, place cotton rolls in position and dry the teeth. Use the same rubber cup to carry the fluoride solution to the teeth, using sufficient engine speed to heat the tooth slightly. This technique allows the solution to enter the grooves and sulci more readily.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 186 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

The EDITOR'S Page

OF ALL THE pains from which man suffers pain about the face and head is the most common. The dentist sees his share of sufferers who come to him hoping for relief. Headache is almost a universal malady and the person who has not at some time had this distressing condition is rare indeed. The line of demarcation between pain in the face and pain in the head is often a finely marked one. Irritation in the jaws and in the teeth have been sites of origin of irradiated pain that is expressed in the face, in the temporal and occipital areas of the skull. Differential diagnosis is often difficult because many extra and intracranial conditions may produce cephalgia.

Among the extracranial structures of the face and skull that may be the loci of pain are: the skin, the subcutaneous tissues, arteries, muscles, fascia, tendons, ligaments, the temporomandibular joint, the periosteum and bone, the eye, the teeth, and the mucous membranes of the mouth, nose, and nasal sinuses. When we consider the multiplicity of syndromes that may affect these tissues we have an idea of the enormity of the diagnostic and treatment problem and the important relationship that the dentist may have to the solution.

Headache of intracranial origin is thought to be associated with the stretching of nerve endings that are distributed along the course of the intracranial vessels. According to Pickering¹ "These arteries probably lie in the meninges because of the striking increase in pain produced by shaking the head. They are also probably supplied by the fifth cranial nerve since headache is absent from that side of the head when the nerve has been cut or the gasserian ganglion injected with alcohol." In other words, the intracranial blood vessels and the teeth have the same innervation. Although relatively little is known of the mechanism of referred or irradiated pain, we do know that an irritation, for example, of the third division of the trigeminal nerve may be expressed by pain in the second division: the pulp inflammation in the lower molar being expressed as pain in the upper jaw. This is a clinical fact that would suggest that a stimulus in the sec-

ond or third divisions, which are within the zone of the dentist's interest, might produce pain in the first division from which arise the nerve endings that supply the intracranial vessels. It would, therefore, seem possible from a neurologic premise to explain some forms of intracranial headache as originating from dental disease.

These practical words by Pickering should be of interest to dental diagnosticians: "In the first place, many of the intracranial varieties of headache have well-defined properties and many are accompanied by physical signs of disease. In the second place, many varieties of extracranial headache last for days or weeks or months without remission and without general signs of disease. In fact when a patient is referred to me with headache of weeks' or months' duration, I always think an extracranial cause the more likely, just as in abdominal or thoracic pain of this duration a visceral cause is improbable. In the practical handling of the patient the recognition of a trivial, as opposed to a serious, cause of the symptoms is perhaps the most important decision that the physician has to make . . .

"The headache induced by fatigue and by worry may also be due to prolonged contraction of the muscles of facial expression. Many of such subjects present deeply furrowed brows, the result of prolonged contraction of the frontalis. Sustained muscular contraction is known to be painful, probably because the contraction stops muscle blood flow. In my own case, when I get such a headache I can relieve it at once by consciously relaxing the muscles of facial expression. Many extracranial headaches are much more difficult to define and to understand. They may result from trivial injury or be associated with palpable and tender nodules in the muscles of the scalp and back of the neck."

If ischemia of muscle produces severe pain, as experienced in myocardial infarction following coronary occlusion, it is quite possible that less severe pain follows deprivation of blood to the facial musculature, including the muscles of mastication. This is a condition worthy of consideration by dentists in evaluating facial pain.

¹Pickering, George W.: Headache, Proc. Inst. Med. Chicago 18:226-232 (Jan.) 1951.



Vitamin K

As far as is known the sole function of vitamin K in man is its participation in the formation of prothrombin. Prothrombin is one of the substances involved in the clotting of the blood.

When there is a deficiency of prothrombin, there is a delay in or failure of clotting, with the result that hemorrhage may occur. A deficiency of vitamin K, by lessening prothrombin formation, delays clotting and is manifested by hemorrhage. It is believed that prothrombin is formed in the liver but the exact part which vitamin K plays in its production is unknown.

The vitamin is rather abundant in food and is formed in the intestines by the action of bacteria. Therefore deficiencies of the vitamin are rarely the result of a dietary inadequacy. Rather, a deficiency occurs because of some condition which interferes with the production of the vitamin in the intestines or its absorption from the gastrointestinal tract. Because it is a fat-soluble vitamin, the various conditions interfering with the absorption of fat, such as (1) obstructive jaundice, (2) sprue, and (3) celiac disease may interfere with the production of vitamin K.

The abnormality resulting from vitamin K deficiency itself can be considered entirely functional and the organic changes simply those of the resulting hemorrhage. These changes do not differ from those of hemorrhage of other origin. Hemorrhage in vitamin K deficiency is not spontaneous. It follows trauma, even though the trauma may be relatively slight. Vitamin K deficiency does not precipitate bleeding.

The clinical picture of the deficiency is that of hemorrhage, divided into three major groups: (1) Hemorrhage of the newborn, (2) hemorrhage associated with disorders of intestinal absorption, particularly those resulting from obstructive jaundice or interference with the production of vitamin K by the bacteria in the intestines as might be the case after prolonged use of such

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drugs as the sulfonamides, and (3) a simple form of hemorrhage accompanying general malnutrition and inadequate intake of food. This form is comparatively rare.

Clinically, the greatest amount of vitamin K deficiency is probably that associated with and resulting from jaundiced states. The deficiency results from the interference with the absorption of fat and, hence, of vitamin K from the intestines.

The deficiency is detected by the appearance of hemorrhage and by a determination of the concentration of prothrombin in the blood. For practical purposes, the deficiency is confirmed by the increase in prothrombin following treatment with vitamin K. The deficiency should be suspected from a knowledge of the patient and confirmed by the prothrombin test. Vitamin K deficiency is one of the few deficiencies in which a quantitative measurement of the body's store or reserve is possible, permitting an accurate determination of the point at which a true deficiency occurs. At a prothrombin level below 20 per cent of normal, a delay in clotting appears.

The incidence of the deficiency in

the general population is not known. It is known to occur frequently in patients with sprue, jaundice, and other diseases which interfere with intestinal absorption, especially fat absorption. It is also found in malnutrition. Except for the newborn, the disease will most often be found among patients ill with other disease.

A number of artificial vitamin K preparations have been developed. Probably the most widely used is menadione U.S.P. This may be given by mouth or injection. It is somewhat more effective and faster in action when given orally than by parenteral injection. The prophylactic use of this agent is advised in cases where a vitamin K deficiency is suspected or determined.

Youmans, John B.: Deficiencies of the Fat-Soluble Vitamins, J.A.M.A. 144:34-45 (September 2) 1950.



Psychosomatic Aspects of Gynecology

In gynecology it has been estimated that the incidence of psychosomatic disorders is at least 33 per cent. Even this figure is misleading in view of the fact that when evidence of a disease process exists in a particular patient it may have relatively little if any importance in the production of the symptoms for which the patient seeks relief.

For general purposes in all branches of the healing art there are three important psychologic periods in women: (1) The infantile stage is the period of parental identification. (2) The pubertal stage is the period of beginning maturity. (3) The menopausal stage is the phase of early old age.

The psychologic attitudes and conflicts crystallized during the period of basic parental attachments are reflected to a marked degree in the two later periods. The person permitted to grow in an environment which can allow resolution of the basic affective drives of the five-year-old child will rarely suffer to any major

degree during the physiologic eruptions of the menarche and meno-pause. It is recognized from experience that the course of puberty permits prophecy of the trends to be found in the climacteric.

During the preoedipal period the child is disengaging himself from the utter dependency of infancy. This occurs between one and one-half and three years. The child is still unsure as an entity but rebellious at his need for assistance. The task of the wise parent is that of adding to the child's independence and security by offering support only when needed.

Puberty also repeats the preoedipal period in its qualities of struggling for liberation and independence and in the lesser importance of the relationship to the father. In the preoedipal and prepupal periods the primary emotional attachment is that between mother and daughter. In the subsequent stages the ties toward the father become of paramount importance. Because of the intense importance of the mother in the emotional development of the child, the mother's own emotional difficulties act as a barrier, often never overcome.

The latter phases of each of the three periods also have much in common. The oedipal period, roughly four to six years, for a girl is recognized as being more complicated than for the boy. During this period the change of the love object from the mother to the father occurs, carrying with it some awareness of sexuality as genetically determined.

During the pubertal stage, friendships and close human relationships turn in general from those of the same gender to those of the opposite sex. The impact of menstruation is felt with all its psychologic implications. It is obvious that the conflicts of the earlier period must by virtue of similarity be reactivated by those of puberty. Similarly, the physical changes and freedom of affective drive characteristics of the climacteric are but overtones of the earlier periods.

Thus it must be realized that the woman patient contains within her conflicts and resolutions of conflicts,

completely without her awareness and often out of her immediate control, which will always affect what she presents to the clinician. This observation should be of value to the dentist in his management of the entire family. Mother and daughter relationships and behaviors furnish a clue for rendering better dental service.

Giffin, Mary: The Psychosomatic Aspects of Gynecology, M. Clin. North America 34:995-1008 (July) 1950.



Hay Fever

Hay fever is a symptom complex. It is characterized by (1) excessive sneezing, (2) a watery nasal discharge, and (3) lacrimation and itching of the eyes and nose. These symptoms recur seasonally in persons who are allergic to plant pollens.

The most characteristic feature of hay fever is its periodic recurrence. Roughly there are three seasons of hay fever: (1) trees pollinate from January through April, (2) grasses pollinate from May to the middle of July, (3) weeds pollinate through the summer until the first frost. There are areas, such as parts of California and some of the Southern states, in which pollination occurs throughout the year. This is particularly true in warm regions where irrigation is used.

It is necessary to know the clinical flora in each patient's environment as well as the pollinating seasons in order to discover the offending pollens. The clinical symptoms of hay fever will be worse when the pollen counts are high. Thus, when the air is dry and windy, severe symptoms may be expected.

The clinical diagnosis is usually not difficult. It must be differentiated from common colds, vasomotor rhinitis, and acute or chronic sinusitis. The specific diagnosis consists of making skin tests to detect pollens to which the patient is sensitive.

Pollens which are plentiful in the environment and ripe at the time of

attack are selected for skin testing. Scratch testing will show the offending pollens. Intracutaneous testing, if used in gradually increasing concentrations, will not only determine the offending pollens, but will also give the degree of sensitivity of the patient and thus help determine the dosage in treatment.

The greatest complication of hay fever is asthma. Fifty per cent of untreated hay fever will develop asthma. This is preceded by bronchitis which should be a warning. Sinusitis may develop because of continued nasal block. Lowered allergic thresholds may give rise to other allergic manifestations.

Specific treatment consists of giving gradually increasing doses of the specific pollen to which the patient is sensitive. Thus his resistance is built to that particular pollen.

There are three methods of treatment relating to time: (1) The first and preferred one is prophylactic or preseasonal. In this method, treatment is started at least six weeks in advance of the season. (2) The second time method is phylactic or co-seasonal. This is used mostly for patients who come for treatment for the first time during a seasonal attack. (3) The third method is in the perennial or annual method. In this, the patient receives an injection every few weeks throughout the year in addition to preseasonal treatment.

Secondary factors may interfere with treatment. These include factors which lower allergic threshold. If a patient shows a high sensitivity to any of these antigenic factors, other than pollens, these factors should be included in the desensitization therapy.

The antihistaminic drugs have been of great value with desensitization therapy. They have in no way replaced the injected pollens but they will control the symptoms during the days when the pollen counts are high. The antihistamines should be used as supplementary drugs and not as a replacement for pollen injections.

Generally the prognosis of pollen desensitization is excellent. Most patients respond to three or four sea-

designed specifically for plastic

AND TO AVOID CUSPAL INTERFERENCE



Note grooves A A in above upper first molar. Lower buccal cusps slide smoothly along these directional arrows with no mechanical interference.

NOTE

sons' treatment. A few respond to only one season of treatment and others may need years of treatment. There is no way to tell in advance the time required for satisfactory results.

Moore, Merle W.: *Management of Hay Fever, Postgrad. Med.* 8:125-126 (April) 1950.



Eating Habits of Children

Many parents express great concern over the eating habits of their children during the period from about one and one-half to two years of age. Children seem to "pick" at their food and take little interest in the things they formerly relished.

Parents become alarmed and begin checking daily weights and recording temperatures several times daily. To their consternation, there is little or no weight gain; perhaps a slight loss.

Some pediatricians refer to this period as the "16-month disease." It often demands convincing argument on the part of the practitioner to assure the parents that nothing is wrong.

This is a truly physiologic period. Three normal events are recognized in this period: (1) The rate of weight gain almost invariably decreases when children are about one and one-half to two years of age or when they weigh about 30 pounds. An infant usually gains more than a pound each month for the first six months, less than a pound a month for the second six months, less than half a pound each month in the first part of the second year, and then he usually fails to show any appreciable gain at all for a while. He remains at or about the same weight for weeks or months at a time.

(2) The child becomes extremely active. Having now developed great skill and speed in locomotion and finding innumerable outlets for a seemingly inexhaustible store of energy and curiosity he is altogether too busy to take time out to eat. Growth in length continues, however, so that he changes almost overnight from a chubby babyhood to the typi-

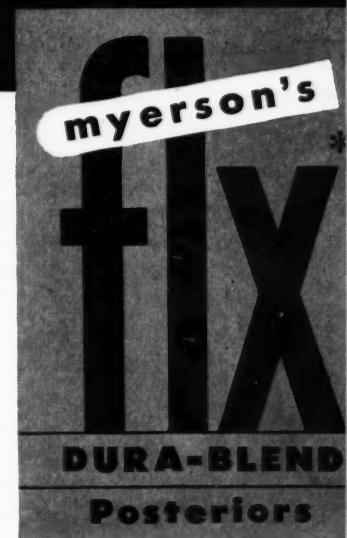
- Note sharp cusp ridges; surfaces that meet at cusp ridges are flat and smooth.

Between lingual cusp ridges, instead of natural sulci there are two grooves directed inward and anteriorly following natural movement of lower jaw. Buccal cusps of lower molar slide along these grooves without mechanical interference. This unusual formation operates to keep cusp ridges sharp and prevent dimensional loss of teeth.

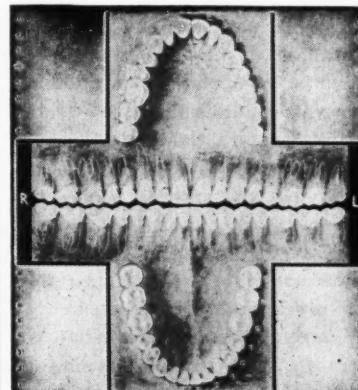
FLX posteriors offer no setup problems. Geometric type ridges fall quickly and naturally into position in the opposing grooves.

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cal linear habitus of childhood. He exchanges "baby fat" for muscle, trading tissue for tissue rather than adding to the total mass. It is surprising to most people to learn that a child's height at the second birthday is usually equal to about half his height at maturity.

(3) Anatomic growth of nervous tissue is about 60 per cent complete at the second birthday. It then proceeds at a slower rate until it is virtually complete ten or twelve years later.

In dealing with these children it is wise to omit any discussion of appetite, weight, or feeding difficulties in their presence. There should be no foods allowed between meals. There is no virtue in confections taken between meals at any age. In growing children confections can serve only to replace foods much more valuable nutritionally. It can usually be assumed that the child with a "sweet tooth" is not getting the proper food for optimal growth and development. This point alone certainly is worthy of consideration for the dental health of the child.

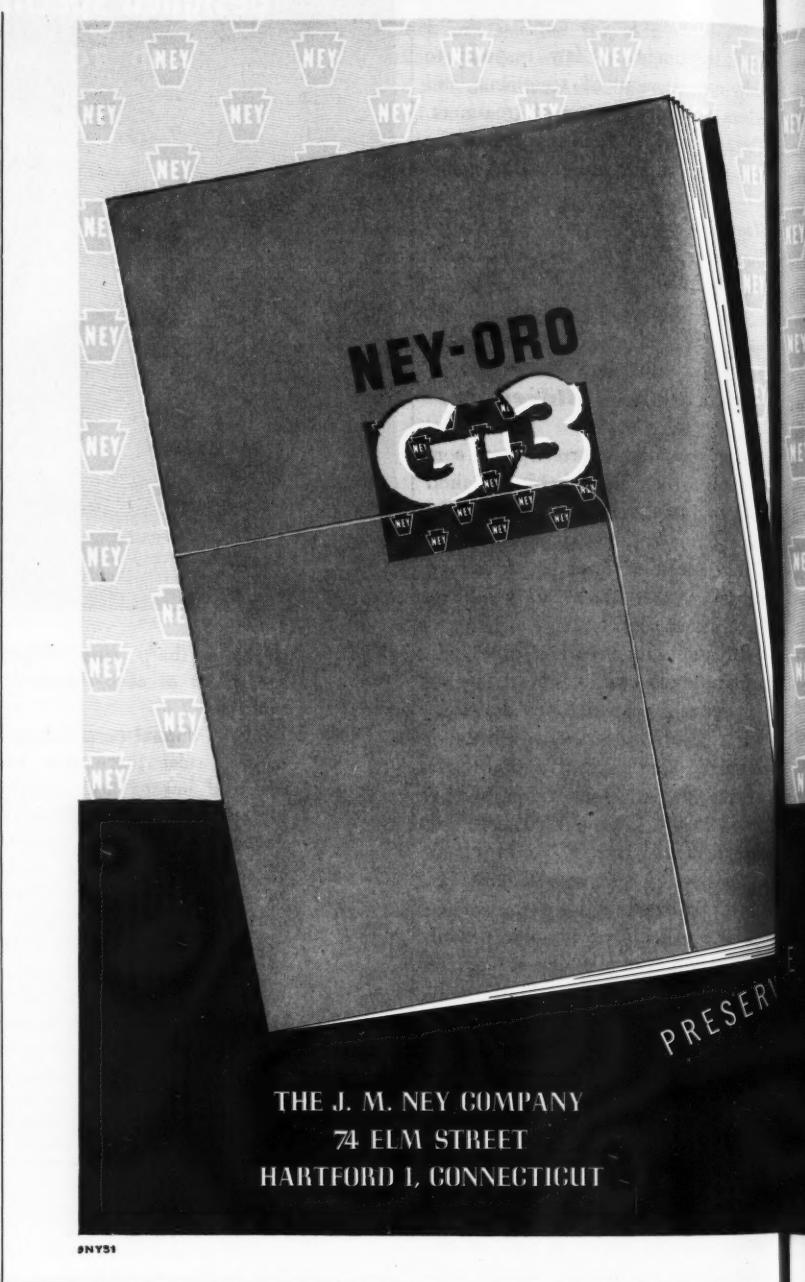
Symposium: Anorexia in Early Life, Internat. M. Digest 57:178-182 (September) 1950.

Pregnancy Following Mastectomy

There is a pronounced difference of opinion on the advisability of pregnancy following mastectomy. Some believe that operation for cancer of the breast should be followed by either surgical removal or irradiation of the ovaries. Others believe that such a course is not justified and that even pregnancy should be allowed.

Estrogens, like thyroid, enhance growth and development in certain tissues. Pregnancy releases large amounts of estrogen.

If it is certain that a cure has occurred in any particular case then harm would not come from a pregnancy. An interval of two and one-half years would appear to border on a cure. However, lesions have been



known to metastasize as late as ten years after an operation.

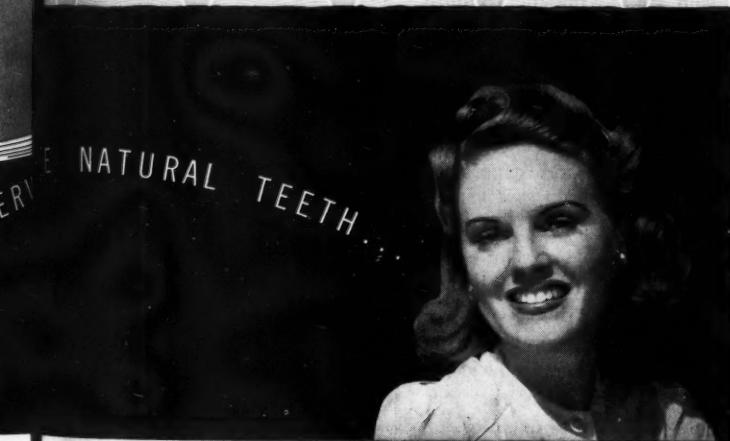
There are other factors to consider: 1. If the mother's chances are hopeless does she have the right to bear a child that she may be unable to care for? 2. Should she be allowed the pleasure of a child if she longs to have one? The child has certain rights which must be considered.

In any event, when pregnancy is certain in these patients there are three possible choices: (1) The preg-

nancy may be allowed to continue while watching carefully for metastases. (2) A therapeutic abortion may be performed and the patient advised against pregnancy in the future. (3) A hysterectomy may be performed and tubes and ovaries removed. This is a radical procedure in most cases.

Queries and Minor Notes, Pregnancy Following Mastectomy, J.A.M.A. 144:286 (September 16) 1950.

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Colostomy

At times the surgeon may perform an operation which is necessary for the preservation of life, but which may cause psychic trauma of sufficient severity to alter the social pattern of the patient concerned. Such a condition is especially true in the management of patients upon whom

colostomy has been performed for some pathologic condition of the lower colon or rectum.

These persons usually are elderly persons. A normal bowel habit has a salubrious effect on them as a normal expression of a heavy physiologic process of the gastrointestinal tract. The sudden loss of a frequently used physiologic process must of necessity give rise to disturbing reflections.

The range of disturbing thoughts running through the minds of these

patients during the period following the immediate postoperative period is indeed considerable. Often these disturbing questions find external expression in the patient's disinterest in his own physical health. An apathy toward getting well supersedes the preoperative anxiety for correction of his illness.

The problems involved fall into three main categories: (1) that of the individual and his colostomy, (2) the relationship of the patient with his family, and (3) the relationship of the patient with his friends or social group.

The patient with a permanent colostomy must make some adjustments. During the process he must have help and understanding. The surgeon and the general practitioner can do much to bring the patient back to normality. In many patients the operative procedure destroys nerves which play a part in the sex cycle. Loss of libido, impotency, and absence of an ejaculatory reflex are common. These results may mean much to the patient (especially the younger patient).

When a colostomy is to be temporary the mental anguish is not a serious problem. When the colostomy is to be permanent the patient is encouraged to return to his former activities, occupation, and way of life. The use of the colostomy bag is abandoned, and new appliances are employed which eliminate odors, do not bulge, and are quite invisible.

Ficarra, Bernard J.: Psychic Trauma Associated with Colostomy, Geriatrics 5:219-221 (July-August) 1950.

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Heat sterilization—not chemical disinfection—is indicated on all hypodermic needles and instruments that are hinged, have deep narrow cervices, or surfaces with difficult access, or are suspected of having been contaminated with spores or *Mycobacterium tuberculosis*.

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young, others are required to live a curtailed and restricted life. Different personalities accept their fate in different ways. A few turn into grumbling and complaining hypochondriacs forever living under a cloud of fear of a fatal attack. As Alvarez, formerly of the Mayo Foundation, says it: "The lesson for every sufferer is that fear of a disease is often more disabling than the disease itself."

At the other pole are the ones that disregard the rules of sensible living and flout the fates by excessive smoking, coffee drinking, violent exercise, and fatigue. In the middle group are the ones with common sense who accept the anatomic and physiologic fact that a damaged myocardium is not the same that it was before it was deprived of some of its vitality. These people know that an injured heart muscle is like any other injured tissue and that it should be treated with respect and without excessive functional demand. To these people who are looking for a philosophy of good living I suggest frequent readings of the article by Doctor Willard Ogle, Editor of the *Texas Dental Journal*, and Trustee of the American Dental Association. Willard speaks from first hand experience when he writes:

"Living with a damaged heart muscle will be a whale of a lot easier and far more satisfactory than can be imagined in the first few weeks following injury. If your comprehension of results following heart attacks be based upon apprehension, we fear you will be in for foul weather. Your heart has not been unfaithful to its duty. You have in many ways placed entirely too much strain upon it, and the only alternative present was recourse to default in fulfilling a contract, due to the impossible assignment required.

"We stated an adjusted attitude to the new form of life as essential. This is most important. In the place of your usual vigorous hobbies, exchange same for less demanding exertion. To be sure, you can get along in great style without tennis, golf, tobacco, and coffee.

"There are many tokens of daily

life one can avoid with impunity, and with saving grace for the new physical and mental habits. When we walk, walk slowly, and sedately, without the usual rushing, disturbing reflections. When we fish, leave the motor lifting for the other fellows, and let them row the boat when necessary. (Let your wife move the piano.) There never was a sane reason for running upstairs, now you know better. Now is the ideal time to enjoy being lazy. Many heart specialists prescribe a little nip now and then for medicinal purposes. Honest, life is not too bad with this new type of living.

"Eat less; you will enjoy what you eat all the more. Talk less, you will enjoy more intelligent conversations. When you walk observe nature in her glory which you have never before seen, due to the rush of life. In our experience we gained confidence and renewed interest in observance of the common and ordinary around us. An old alley cat was a source of immense fun. A little bed of flowers offered great returns for a sit-down task. Smell of earth was refreshing.

"Certainly, I missed coffee and my

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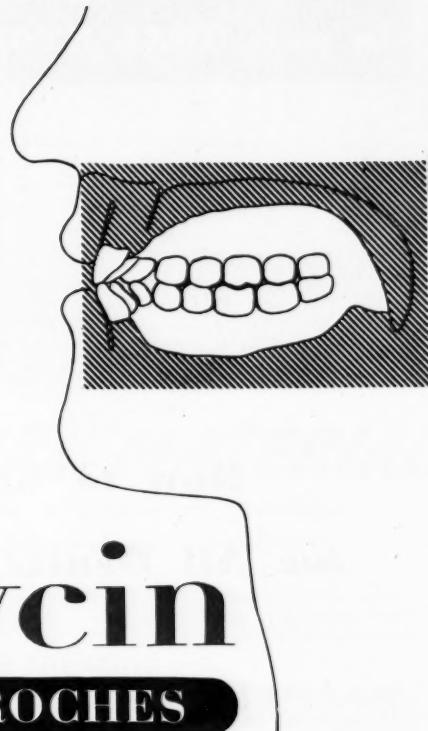
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Indications: Crystalline Terramycin Troches are often valuable in the treatment of Vincent's infection, particularly in conjunction with systemic therapy; as an adjunct to dental procedures in the treatment of such conditions as pericoronitis, and in the prophylaxis and treatment of many other superficial mouth infections.

Administration and Dosage: Daily dosage of 8 to 16 troches has usually been found adequate. A troche is placed in the lower gingivobuccal groove and permitted to remain without sucking or chewing until completely dissolved.

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In your ORAL HYGIENE this month



How to Get Cash for All Dental Services

Many dentists have solved their credit problems satisfactorily by enlisting the services and co-operation of a bank. John Y. Beaty, a former editor of the *Banker's Monthly*, explains some of the plans which have worked out well for both the bank and the dentist. Patients seem to react favorably to the plans and, in general, appreciate the opportunity to pay for their needed dentistry in monthly installments. If you have not already established such a plan, you will want to read Mr. Beaty's fine article.

★ ★ ★

Doctor Fred D. Miller, of Altoona, Pa., appeared recently before a special committee of the House of Representatives to tell them of the relationship between dental caries and the use of refined foods and carbonated drinks. Doctor Miller stressed the need for better nutrition as a national health measure, and suggested taxing sugar and refined flour as "luxuries" since they are, in his opinion, "foodless foods."

★ ★ ★

Do you record your conversations with your patients? . . . It might be a good idea if you're interested in improving your patient relationships. Marie Frances Meany tells of one dentist who, wanting to check on his method of presenting dental explanations at the chair, installed a wire recording instrument. He has been well pleased with the experiment.

Whatever else is "just around the corner," we can be pretty sure that inflation is one of the accompaniments. In dentistry, the slated mobilization of 26,000 dentists—one third of the entire dental population—will leave the way open for unscrupulous practitioners to raise fees unduly and for the black-marketers again to peddle denture service. It is suggested that such practices can be anticipated and prevented by action on the part of the dentists themselves. Local groups which institute voluntary fee ceilings will be safeguarding their own practices. Such groups, if they take action to preserve the practices of colleagues called into service, will be doing the whole profession a great service. You will want to give more than passing thought to Gordon Duncan's clear warning, "Watch Out for Dental Inflation."

★ ★ ★

An explanation of the plan prepared for developing state and local civil-defense health services includes a chart showing the personnel requirements for a first aid station. Since dentists will be an important part of every community's nucleus of trained personnel, this explanation of special service in case of disaster is of vital importance.

★ ★ ★

All of the regular departments and features, too, to give you pleasant, instructive reading.

old pipe. I missed running under the intangible whip. I missed hunting. I longed for a good fishing trip. But I was never as bored as expected. There was time for reading and writing, and just thinking. Adjustment of your mental capacity to your new physical limitations is necessary. We stress this because no other one effort appeared to be so helpful. Take life *one day* at a time, say your prayers at night, kiss the good wife—and have peaceful rest.

"Someone said that 'life is no more than the accomplishment of three major duties—1) filling what is empty; 2) emptying what is full; 3) scratching what itches.' No one has a monopoly on good nature and optimism. Wade in and help yourself. Let the telephone ring rather than jump and run to answer it. Next time you are inclined to raise the roof, don't do it—raise your eyebrows or your hat, and look the other way.

"Recall the chap who sold his farm and traveled far in search of oil, only to die away from home, a failure? The man who purchased the farm later discovered fabulous pools of oil under the surface. Follow the routine approved for you by your physician. Be very cautious in your early days of illness in extravagant acts and words. An old rich skinflint was seriously ill. The village preacher called on him and the patient said—'Help me parson, pray for me, and if I get well I'll give the church ten thousand dollars.' After his recovery, the pastor was never able to corner the old guy, until one day he caught him in the courthouse. The pastor reminded him—'You promised the church, if you got well, ten thousand dollars.' Said the old man—I did? Well, that gives you a rough idea how sick I must have been.'

"Avoid heavy arguments, and political meetings. You may find it expedient to forego football and baseball. Use common sense and do not bankrupt a courageous but weakened heart; it can remain solvent for many happy years, with intelligent cooperation on your part."

What do you Mean, Normal?

The emeritus professor of medicine

of Yale University, Doctor George Blumer, asks that question. Every day clinicians are required to determine what conditions may be encompassed within the bounds of the normal and what ones should be looked upon as so divergent as to be considered pathologic or abnormal. We are learning that normal is not a pinpoint in time or position, but that normal is a broad highway upon which one travels subject to the usual pulsations and rhythm of the biologic processes.

What is a normal occlusion? Is it one that fulfills certain static positional requirements or is it one that fulfills functional needs without destruction of tissue? What is the latitude of compensation possessed by tissues and organs? What is the work load of efficiency that the denture wearer should be able to tolerate? These are among the questions that are provoked by the mature essay written by Doctor Blumer.

Here is the complete article from that excellent new medical publication, GP:

"While human beings are, in a broad sense, all of a pattern, one of the most interesting things about them is their variability. Any anthropologist can point out differences in varied racial stocks, and even the general public knows that there are humans whom we speak of as pygmies and others, such as the northern Scots and the Scandinavians, who tend to be oversized. As to mental qualities, the consensus tends to the view that, given equal opportunities for education, there is not much difference in the mental capacities of different races.

"All of this has a very practical bearing on the problem of medical practice for, as disease is technically 'any departure from a state of health,' it is obvious that such departures cannot be assessed without knowledge of the limits of normal. One does not need to look back many years to realize that our concept of the normal changes from time to time. At the end of the Nineteenth Century, for example, much was written about ptosis of the abdominal viscera, Glenard's disease as it was



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often called, and it was only after the development of x-ray technics of gastrointestinal examination that we realized that there were striking variations in the gastrointestinal arrangement of normal individuals. While abnormal dislocation of the abdominal contents could occur, we had been unaware of the limits that separated the normal from the pathologic.

"The same situation probably still exists in some other fields of human anatomy and physiology despite our continual attempts to delimit the normal from the abnormal. For example, take the question of height. We now

call certain perfectly healthy individuals giants because they exceed in height a purely arbitrary measurement of 82 inches and others dwarfs because they are less than 52 inches in height. Of course there are also giants and dwarfs whose stature is definitely due to pathologic factors. Our ideas as to the height-weight ratio are based on the massive statistics of the life insurance companies who publish tables not of normal but of average weights at different age periods. At best such tables give but a rough estimate, and the physician must use his judgment as to whether

CLINICAL AND LABORATORY SUGGESTIONS

(See pages 174 and 175)

Form to be Used by Contributors

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708 Church Street
Evanston, Illinois

From: _____

Subject: _____

Explanation of Procedure:

Sketch: _____

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a given patient is over- or under-weight by taking into account such factors as inheritance, the bony framework, and the bulk of the musculature.

"As to physiologic data, this discussion was sparked by a recent article on blood pressure by Master and his associates in the *Journal of the A.M.A.*, August 26, 1950. This study clearly shows that our current conceptions as to the line between normal and abnormal blood pressures have probably been erroneous, even if we remember that negative tests do not absolutely rule out early pathologic changes.

"The practical significance of all this lies in the fact that we are apt to take too much for granted, especially the correctness of data in the form of figures and tables. We must constantly bear in mind that these are not mathematical or chemical formulae but approximations only, and that not for diagnostic reasons alone but also because of adverse psychologic effects on patients, in each case we must try to decide as nearly as possible where the normal ends and the abnormal begins. If we do not do this, we may lead normal patients to believe that they are suffering from serious complaints."

The Newer Dental Pathology

An item from Hollywood describes a new and fearsome syndrome that strikes girls with inlays who insist on going high on vacation. Science is indebted to Miss Sheilah Graham for her report in *Hollywood Chatter*: "From now on Andrea King stays in low altitudes. When she went high up on her recent vacation, the height caused an inlay in her back teeth to expand. It pressed on the nerves, causing abscesses and an operation."

Every now and then I encounter one of my own patients who has experienced a necrotic pulp condition under one of the inlays that I have placed. In moments of candor I find that my colleagues admit to the same distressing experience. I have always been at loss to explain to the satisfaction of the patient how come. My technique of explanation has been to

take high flights into the biologic stratosphere with careful admixture of such imposing words as "Streptococcus," "invasiveness," "resistance of the host," "threshold of susceptibility," ending on the elevated note that infection is a strange and mysterious process—which it is.

To say that these explanations have always been convincing is to be slightly under par for truthfulness. Some of the patients have harbored a thought that possibly there was some grievous omission or commission in my technical procedures that might explain their plight. Only a few have made overt expressions of their doubts. Naturally, I dismiss them as unreasonable and uncooperative patients.

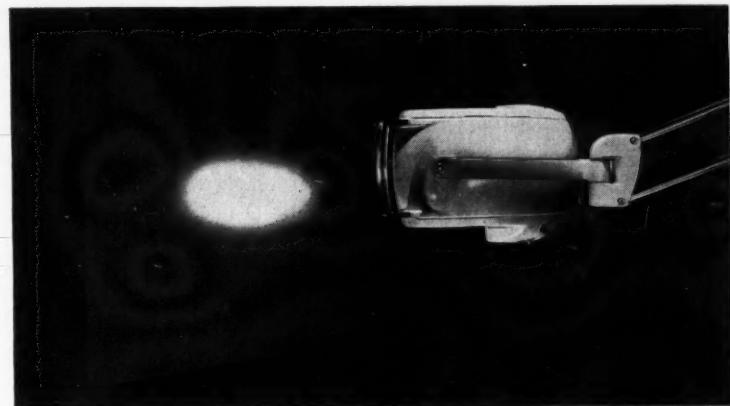
Now, with the recent case report from Hollywood, all we need to know in our diagnostic approach is whether the patient has been high—up a mountain trail, taken a flight in a plane, a ride in an elevator, or an exhilarating dose of liquor. If they have been guilty of any of these indiscretions, we have a ready-made reason for their condition as reported in the celebrated case of Miss Andrea King and her expanding inlay.

If your patient or mine should wonder why his "pure gold" inlay should expand on such slight changes in atmospheric pressure, we can show indignation and ask who is he to expect a fate different from beauteous Miss King who had an inlay that expanded and needed an operation yet. After all, why should an ordinary patient think that he can get less expanding gold than a Hollywood picture star.

Next time you have a pulp die, as we say in the trade, and a juicy ripe abscess develop in the tooth with the shiny gold inlay, don't be hangdog or smothered with guilt feeling. You can't expect a person to stay at low altitude all his life, can you? Everybody is entitled to take a high fling once in a while, but as your friendly dentist says: "Watch those expanding inlays!"

—E. J. R.

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Swelling of the Cheek

Problem

1. A twenty-two year old woman complains of unilateral swelling of the cheek eight to ten days after each menses. The condition has persisted about eight months.

2. The swelling is nonpainful, lasts three days, and starts in the region of the malar eminence. During the course of the three days the swelling spreads down over the cheek proper

and finally disappears. There is no associated discoloration of the face or other signs of local pathology.

History—1. Two years ago the patient underwent a Baldy-Webster suspension, tubal ligation, and appendectomy.

2. Four years ago the patient had a normal term pregnancy and to date her periods have been normal.

3. Results of physical examination and routine laboratory tests were essentially negative.

Treatment—1. The patient was placed on a salt-free diet, 10 grains

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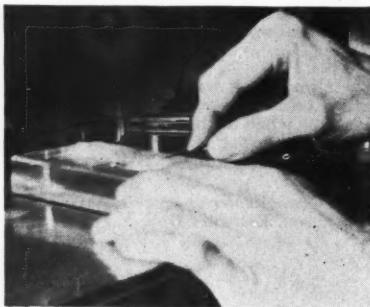
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(0.6 grams) of ammonium chloride three times a day and 20,000 units of estrogens every three days for 5 doses.

2. She was not seen until the swelling recurred, three days prior to her next period. The swelling had completely abated by the first day of the menses.

3. She received the same treatment the following month, and while the swelling recurred just prior to the period, it lasted only two days and was not as pronounced.

4. During the third month under observation she was given 10 milligrams of testosterone propionate twice daily for the first fifteen days of the cycle.

5. The patient had no swelling during that cycle. What would be the most likely diagnosis?

Discussion

The condition is part of the syndrome known as premenstrual tension in which all types of bizarre swellings may occur in different parts of the body.

Etiology—It has been stated that premenstrual tension is caused by (1) an increased amount of estrogen in the blood before the onset of menstruation, or (2) an insufficient amount of progesterone secretion at this time.

A single mechanism has been postulated for the development of the variety of changes which occur; namely, that premenstrual distress is the result of sodium ion retention by the different tissues of the body under the influence of the ovarian steroids.

The retention of sodium ion is associated with an increase in extracellular fluid in the tissues which may be microscopic in amount or may develop into gross edema.

Basic of Symptoms—Under this theory the neurologic symptoms result from edema of the nervous system, probably the brain; the nausea and bloating of the abdomen result from edema of the gut; and the other symptoms arise from the specific organs affected.

Therapy

1. On the basis of this hypothesis

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ammonium chloride could be administered by mouth, a salt frequently used for removal of edema fluid in cardiac and renal disturbances, although not in the usual diuretic doses.

2. The patient is advised to refrain from adding table salt to food during the last two weeks of the menstrual cycle. During this time she is given 0.6 grams of ammonium chloride 3 times a day.

Adapted from *Queries and Minor Notes, Journal of the American Medical Association* 144:1325 (Dec. 9) 1950.

Dryness of the Mouth

DRYNESS OF the mouth due to diminished secretion of saliva is a distressing condition. It may lead to redness, soreness, and fissuring of the mucous membranes, with eventual atrophy. In severe cases rapid deterioration of the teeth follows. Chewing and swallowing may become difficult. Inadequate amounts of saliva may result from (1) a decrease in salivary gland substance (congenital hypoplasia, senile atrophy, destruction following surgical intervention, irradiation, inflammation or neoplastic infiltration); (2) disturbances of innervation (central or peripheral nerve lesions, emotional states, psychoses, interference with conduction of nerve impulses due to drugs, toxic agents or metabolic disturbances); (3) dehydration, and (4) unknown causes (Sjogren's syndrome). In Sjogren's syndrome dry mouth is associated with dryness of the eyes and mucous membranes of the nose, throat, and vagina and with deficient gastric secretion. Many of these features suggest deficiencies of vitamin A, nicotinic acid and riboflavin and some of them are seen in pernicious anemia, iron deficiency anemia and Plummer-Vinson syndrome. There is a frequent association of the syndrome with rheumatoid arthritis and with the endocrine changes that occur in postmenopausal women. Treatment of dry mouth must be directed toward the causative factor.

From *Medical Literature Abstracts, Journal of the American Medical Association* 145:668 (March 3) 1951.

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Akron 8, Ohio, U.S.A.

Hygienic Acrylic



MAKING MAGIC OUT OF MOUNTAINS!

See second cover

D.D.4

UNIVERSAL DENTAL CO.
48TH AT BROWN ST., PHILADELPHIA 39, PA.

Please send information concerning the Five-Phase co-ordinate size system.

Dr. _____

Address _____

City _____

See page 147 D.D.4

COOK-WAITE LABORATORIES
1450 BROADWAY, NEW YORK, N.Y.

Please send us information on Novocain-Pontocaine-Cobefrin.

Dr. _____

Address _____

City _____

See page 148 D.D.4

LUXENE, INC.
118 EAST 25TH ST., NEW YORK, N.Y.

Please send information concerning LUXENE 44.

Dr. _____

Address _____

City _____

See page 148 D.D.4

CONTINENTAL CHEMICAL CO.
GALESBURG, ILL.

Please send an 8 oz. can of NITRODENE at price advertised.

Dr. _____

Address _____

Dealer _____

See page 149 D.D.4

AUSTEN LABORATORIES
5932 WENTWORTH AVE., CHICAGO, ILL.

Please send, without cost of obligation, the "Instant Mold Selector" as advertised.

Dr. _____

Address _____

City _____

See page 150 D.D.4

THE COLUMBUS DENTAL MFG. CO.
COLUMBUS 6, OHIO

Please send, Steele's "Denture Backing Technic" as advertised.

Dr. _____

Address _____

City _____

See page 151 D.D.4

THE S. S. WHITE DENTAL MFG. CO.
211 S. 12TH ST., PHILADELPHIA 5, PA.

Please send information concerning your products.

Dr. _____

Address _____

City _____



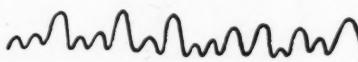
SAD

Greatly magnified view of surface of case, as cast, shows mountains like this . . .



SMEARED

Mechanical polishing smears the surface like this . . .



SMOOTHED

TI-LECTRO polishing cleans the surface and gets greater reflectivity by smoothing the peaks.

Result: Cases have new, lasting brilliance, better fit.



Look FIRST to:

TICONIUM

413 N. Pearl St.
Albany 1, N. Y.

TICONIUM - 413 N. PEARL ST., ALBANY 1, N. Y.

I WOULD LIKE A TI-LECTRO "NEW" FOLDER
WHICH TELLS ALL ABOUT TI-LECTRO POLISHING.

DR. _____

STREET _____

CITY _____

ZONE _____

STATE _____

See page 152 D.D.4

THE L. D. CAULK CO.
MILFORD, DEL.

Please send information on ZELEX.

Dr. _____

Address _____

City _____

See page 179 D.D.4

MYERSON TOOTH CORPORATION
CAMBRIDGE 39, MASS.

Please send booklet on scientific testing of plastic teeth as advertised.

Dr. _____

Address _____

City _____

See page 180-81
THE J. M. NEY CO.
HARTFORD 1, CONN.

Please send information concerning your products.

Dr. _____

Address _____

City _____

See pages 182-189 D.D.4

B. G. HATCH CO.
BROOKLYN 1, N.Y.

Please send information concerning your products.

Dr. _____

Address _____

City _____